Continuing Education of Older Workers

Motivational characteristics in the context of work and life-span

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Abstract

Decreasing birth rates and increasing life expectancy have led to the ageing of the German population during the past decades. To sustain the German retirement system, retirement age is increased to 67 years. The European Union calls for individuals' lifelong learning to maintain work ability and cope with challenges of technological and organisational change. This dissertation consists of a literature overview and three empirical essays investigating older workers' motivation to participate in continuing education (MPCE) and its demographic relevance, highlighting age-specific work context influences and providing evidence for older workers' heterogeneity. The literature overview delineates older workers' demographic relevance as well as their transition to retirement, work motivation, development opportunities, and education. Second, the analysis of cross-sectional data establishes the relevance of older workers' MPCE for the policy of prolonging working life by showing the positive relationship with work ability and the desire to work past retirement age. Older workers' MPCE is high across all respondent groups, implying that inequalities in participation are less a result of varying motivation among subgroups, but of other barriers. Following this, work context-related motivational differences between older and younger workers are identified and analysed. Results show weak but significant influences of some work context factors. The analysis of longitudinal data shows ageing workers' increasing heterogeneity of life satisfaction and satisfaction with work, family life, and health, corroborating life-span theories. In sum, MPCE is high among older workers. It is influenced by work context, and positively related to work ability and the desire to work past retirement age. Common mean-level analyses of older workers yield only limited informative value.

Keywords: Older workers, continuing education, motivation, work ability, life satisfaction, life-span, heterogeneity.

Zusammenfassung

In den letzten Jahrzehnten führten abnehmende Geburtenraten und die zunehmende Lebenserwartung zur Alterung der deutschen Bevölkerung. Zur Sicherung des Rentensystems wurde das Renteneintrittsalter auf 67 Jahre angehoben. Um die Arbeitsfähigkeit zu erhalten und den technologischen wie organisationalen Wandel zu bewältigen, fordert die Europäische Union zum lebenlangen Lernen auf. Diese Dissertation bietet einen Literaturüberblick und drei empirische Aufsätze, die die Weiterbildungsmotivation älterer Arbeitnehmer auf ihre demographische Relevanz untersuchen und altersspezifische Einflüsse von arbeitsbezogenen Faktoren sowie Altersheterogenität belegen. Der Literaturüberblick erläutert die demografische Relevanz älterer Arbeitnehmer, ihren Altersübergang, ihre Arbeitsmotivation und Weiterentwicklung. Anhand von Querschnittsdaten wird der positive Zusammenhang von Weiterbildungsmotivation mit Arbeitsfähigkeit und dem Weiterbeschäftigungswunsch gezeigt. Die Weiterbildungsmotivation Älterer ist über alle Befragtengruppen hoch, was darauf hin deutet, dass Partizipationsungleichheiten weniger von unterschiedlichen Motivationslagen, sondern von anderen Barrieren abhängen. Eine weitere Analyse identifiziert altersspezifische Unterschiede in Hinblick auf den Einfluss von Arbeitsplatzfaktoren auf die Weiterbildungsmotivation. Es zeigen sich schwache aber signifikante Einflüsse einiger Faktoren. Anhand von Längsschnittdaten lässt sich zunehmende Altersheterogenität in Bezug auf die Zufriedenheit mit dem Leben, Arbeit, Familienleben und Gesundheit feststellen. In der Zusammenfassung ist die Weiterbildungsmotivation älterer Arbeitnehmer hoch, sie wird durch den Arbeitskontext beeinflusst und hängt positiv mit der Arbeitsfähigkeit und dem Weiterbeschäftigungswunsch im Rentenalter zusammen. Übliche Mittelwertanalysen älterer Arbeitnehmer haben nur begrenzte Aussagekraft.

Schlagwörter: Ältere Arbeitnehmer, Weiterbildung, Motivation, Arbeitsfähigkeit, Lebenszufriedenheit, Lebensspanne, Heterogenität.

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Table of Contents

List of Tables

List of Abbreviations

CE	Continuing Education
DIW	Deutsches Institut für Wirtschaftsforschung (Institute for Economic Research)
HR	Human Resources
MPCE	Motivation to participate in Continuing Education
OECD	Organisation for Economic Co-operation and Development
SDT	Self-Determination Theory of Motivation
SOC	Selection, Optimisation, and Compensation
SOEP	Socio-Economic Panel
SST	Social Selectivity Theory

1. Introduction

In countries experiencing increased life expectancy as well as low fertility rates, we observe an ageing as well as shrinking workforce (see Birg, 2005; Börsch-Supan & Wilke, 2009). In Germany, the resulting pressure on the labour market and the social security system has led to government policies such as the raising of retirement age and thus a prolongation of individuals' working lives. Organisations, too, act in order to fill vacancies and retain talents. Some market themselves as 'employer brands' or take part in surveys to be ranked and certified as attractive employers and compete for potential and present employees – often on the grounds of working conditions such as salary, workplace attributes, and career prospects, but also on 'soft' and more employer-individual benefits such as work climate and organisational culture. However, retaining workers requires more than the suppression of early labour market exit or offering an attractive work context – continuing education as a means to keep a workforce up-to-date with regard to skills and knowledge to ensure work ability is essential for a long-term work relationship (Armstrong-Stassen & Templer, 2005, p. 57; Picchio & van Ours, 2013) and also represents a benefit in itself.

The vast majority of educational offerings for professionals is paid for and organised by employers (Leu, 2003) who often collaborate with professional institutions to provide training. Participation in continuing education is not only contingent on individuals' motivation. Empirical studies suggest that regardless of their motivation, some groups of workers receive more training opportunities than others – gender, age, task level among other factors seem to lead to varying probabilities of inclusion in continuing education. Also, work context factors play a role. While the opportunity to participate in continuing education is the result of both employers' and employees' initiative, this dissertation focuses on employees' perspective in order to shed light on specifically older workers' human capital acquisition and career investment behaviour (see also Greller, 2006).

The aim of this dissertation is to provide evidence for the demographic relevance of older workers' motivation to participate in continuing education (MPCE), identify age-specific determinants within the work context, and find support for older workers' heterogeneity against

the backdrop of relevant theoretical frameworks. As such, this work contributes to the development of more fruitful measures to include, develop, and motivate this age group in the work context.

1.1 Outline of the dissertation

The first section of this dissertation presents an overview of the broader topic of older workers' role in times of demographic change, as well as the more specific topics of their retirement transition, work motivation, development opportunities, and educational characteristics. Constituting sections 2-4, this dissertation includes three empirical essays investigating the demographic relevance of older workers' MPCE, highlighting age-specific work context influences and exploring the heterogeneity of older workers. With their respective theoretical frameworks, analyses and discussions, they may be read independently of each other. Section 5 concludes this dissertation.

1.2 The role of older workers in times of demographic change

Countries experiencing ageing and shrinking working populations face serious implications for their labour markets and social security systems. Compared to, e.g., the United States, Germany has a more unfavourable ratio of workers to non-workers that puts a special strain on Germany's pay-as-you-go social security system (Börsch-Supan, Härtl, & Ludwig, 2014). The German government expects a ratio of 120 recipients of retirement pay to 100 contributors until the year 2050 (Knapp & Zirkler, 2010). As a reaction to decreasing labour supply, Germany gradually raises retirement age from 65 to 67 years until 2029, which is calculated to provide some relief from the effect of a decreasing working population (Gasche, Bucher-Koenen, Holthausen, & Kluth, 2010). In order to increase economic competitiveness the EU member states developed active ageing strategies to stabilise the ageing and shrinking working population and modernise social security systems. The roadmap calls for the suppression of early labour market exit incentives such as public aid for pre-retirement schemes and the improvement of incentives and working arrangements for longer working lives; e.g., allowing the addition of pension benefits and wage (Commission of the European Communities, 2005). Countries unsuccessful in in-

creasing labour force participation of potential workers are likely to face tax increases and/or welfare cuts (Larsen & Pedersen, 2012) in order to sustain their fiscal systems.

The recent pension policy reforms in Germany have been relatively successful at increasing the number of older workers in employment by imposing a financial penalty taking the form of pension deductions on retiring earlier than regular retirement age. However, there is already empirical evidence that this reform furthers social inequalities by putting especially less qualified and manual workers who cannot prolong their working lives at a disadvantage (Buchholz, Rinklake, & Blossfeld, 2013). Policies such as the raising of retirement age demand an understanding of factors influencing labour supply by older workers, the demand for their labour and also which incentives may reactivate the retired.

The exact age when someone is 'old' cannot be defined objectively. The age of those called old differs widely across disciplines, depending also on the particular area of research interest, such as need of care or consumer behaviour, and the differences one expects between age groups. Research on work and labour market questions usually identifies those aged 45 to 55 years as old since at this age labour participation rate starts to decrease (OECD, 2005) and retirement is already an option that has at least been considered. Thus, relative to other workers this age bracket forms a separate group. However, looking only at older age groups for the analysis of older workers can be short-sighted: "Chronological aging starts at birth and ends at death. Therefore, anyone in the work force (15 to 64 years of age) can be considered an ageing worker." (Ilmarinen, 2001, p. 1).

This approach points to the information that can be gained by looking at the dynamics of ageing across the life span. Old age does not happen suddenly. Also, the decision to retire is not only formed late in work life but depends on personal and environmental factors that influence the process of retirement over a person's lifetime long before the actual step to retire is taken (Beehr, 1986). The decision to retire is also based on future expectations: older workers are likely to take into account their expected earnings from prolonged paid employment but also their expected non-work income and the marginal utility of leisure for their life time left (Disney, 1996, p. 199).

Both working past retirement age as well as un-retiring, i.e. the return to work after a phase of retirement can increase labour force participation of older individuals (Maestas & Zissimopoulos, 2010). Compared to working past retirement age, un-retiring usually does not involve a return to the same occupation but rather to a different job. This is mostly due to dif-

ficulties attaining post-retirement work right away, resulting in a period of retirement before the return to work is possible (Maestas, 2010). In their analysis of international trends of employment rates, Larsen and Pedersen (2012) find that the already increased labour participation during the past 10-15 years also among individuals older than 65 does help lessen the burden caused by an ageing population.

From the economic perspective, in an ageing and shrinking population such as Germany, working past official retirement is one solution to maintain the working population. Proposals for the redistribution of work call for more individuals working, but with the average number of hours decreasing, thus aiming at taking the burden away from the decreasing number of younger workers who balance their work with caring for children and elderly relatives. This may at the same time increase birth rates in younger cohorts by reducing the pressure of work (see Vaupel & Loichinger, 2006). By creating more part-time jobs, older workers could more easily remain active in the workforce. Already an increasing number of older adults work part-time, a trend that is expected to continue as life expectancy increases. However, staying in paid employment is likely to reduce time spent on other activities that often form a part of retirement such as caring for grandchildren or voluntary and community service that also provide value to a society and economy.

The recent increase in older workers past retirement age inspired a body of literature analysing the causes. On the supply side, Maestas (2010) explains older workers' increased labour force participation with a shift in the workforces' skill composition, with every birth cohort being more educated than the previous one, thus holding better-paid, more fulfilling and less physical jobs, accompanied by the technological change that also results in less physically demanding work. Another trend is the increasing labour force participation of women. Especially women with shorter work biographies have an incentive to work longer in order to add to their retirement pay. As couples prefer to retire at the same time, working wives may be partly responsible for also keeping men longer in employment (Smith & Moen, 1998). Just as importantly, increased life expectancy as well as better health at older ages since the 70s enable older workers to continue working (Martin, Freedman, Schoeni, & Andreski, 2009).

On the demand side work has changed during the last decades, with a move away from physical and routine tasks to cognitive and analytical tasks, with a stronger effect for women (Black & Spitz-Oener, 2010). While this would seem to benefit the employment of older workers, organisations still prefer to hire younger workers. Empirical evidence shows that vacancies

created by retiring or released older workers are rarely filled with other older workers but with younger workers, possibly because of higher wage costs of older workers, the too-short amortisation period of required job adjustment investments or their lack of currently needed knowledge (Boockmann & Zwick, 2004). But also ageism with regard to older workers' productivity, motivation and negative age stereotypes are prevalent among not only employers but society in general and may only be eradicated over time through efforts by organisations and government but also older workers themselves (e.g. Billett, Dymock, Johnson, & Martin, 2011; Chou & Choi, 2011).

While retirement before normal pensionable age is an individual choice it also depends on social security, the labour market, and organisations' incentives and behaviour towards older workers – thus, the choice to retire early may not be completely voluntarily but is often made in the context of organisational change that makes it appear more costly to retrain and keep older workers rather than push them into early retirement (Hardy & Quadagno, 1995). Since the 1970s until recent reforms, social security systems in Germany and most other European countries offered strong incentives to retire early, originally intended to boost the economy in times of stagnation and high unemployment (see Buchholz et al., 2013). This resulted in high numbers of older workers exiting the labour market earlier than the age of 65. Although especially early retirement is still attractive to many workers despite of the afore-mentioned reforms, it is not only costly from a macro perspective but may also be a double-edged sword if seen from an individual perspective as outlined in the following section.

1.3 Retirement – individual implications

Retirement marks an important change in older adults' lives. Daily routines, social networks and personal roles may change significantly – and not always for the better. Also, time spent in retirement becomes increasingly longer as life expectancy increases. Most workers look forward to retiring and prefer to retire earlier rather than later (see Büsch, Dorbritz, Heien, & Micheel, 2010; Zappalà, Depolo, Fraccaroli, Guglielmi, & Sarchielli, 2008). However, studies show retirement does not only have positive consequences for the retiree. Looking at income, expenditures and wealth, and also compared to younger age groups, Noll and Weick (2011) show German retirees to still have a high standard of living, with a relative income position that has stagnated since roughly the mid 1990s. However, the authors point out that due to the recent pension

reforms a downward trend in retirement pay and thus old age living standards seems inevitable and may be even furthered by longer periods of unemployment and the growing low-income sector. While many Germans are not too well informed about the pension system and their own status with regard to eligibility or amount of retirement pay, this development is likely to influence the decision to retire at a given age.

Looking at individual well-being as a reference point, cross-sectional studies yield inconclusive results on whether individuals fare better or worse after retiring. While the quick win of more leisure time and income without having to work is obvious, mid- and long-term psychological as well as social implications are complex (Börsch-Supan, 2013).

Longitudinal research shows rather individual adaptation patterns for the transition into retirement and points to multiple subgroups of retirees (see Wang, 2007). A key factor for happy retirement transitions is whether retirement is forced or by choice (Calvo, Haverstick, & Sass, 2009). Central to retirement transition research are theories explaining the psychosocial aspects of ageing, such as role theory, continuity theory and the life-course perspective, delineating how individuals' roles, daily behaviours and activities shape individuals' sense of being and feeling of self-esteem and how adaptive processes help stabilise well-being in times of transition (Wang, 2007). As an individuals' work role, routines, and sources of appreciation may get lost in the process of retirement, well-being is affected to varying degrees. Role theory can offer two outcomes of retirement: decreased well-being if the work-role that has been central to self-esteem is lost, but also psychological relief if work has been perceived as stressful (Ashforth, 2000; Kim & Moen, 2001). Continuity theory states that people tend to stick to familiar activities and values and also maintain their sense of self-esteem regardless of transitions in their lives by making adaptive choices (Atchley, 1989). The life-course approach involves the larger context of an individual's life and highlights the importance of life phase influences and life course trajectories, the marital and financial situation, children, health and personal goals in coping with retirement.

Wang (2007) finds that most retirees, typically those holding a bridge job and leading a happy marriage, are able to maintain their levels of well-being after retirement, lending support to continuity theory. On the other hand, retirees who were unhappy or stressed (physically or mentally) in their jobs experience an increase of well-being, consistent with both continuity and role theory. They seem to lay off their unloved work roles and, consistent with life-course theory, find their well-being again in retirement. Some retirees, especially those forced to retire early,

experience a U-curve, though: they are initially unhappy due to the loss of the work role but recover after awhile (about 6-7 years after the transition) as, consistent with life-course theory, adaptation processes eventually increase levels of well-being. Similarly and analysing German panel data, Börsch-Supan and Jürges (2006) find in the first year after early retirement individuals were initially less happy than before and later in retirement.

These studies imply that those who enjoy work or who strongly define themselves through their work role, especially those who are forced to retire early, enjoy more well-being in retirement if they continue working to some extent - at least during the phase of transition.

The effect of retirement on health is ambiguous and involves measurement difficulties, such as the occurrence of justification bias, both with regard to objective as well as self-rated health especially in the context of early retirement (Bound, 1991). Most studies show the earlier individuals retire, the higher their health and mortality risk, although some evidence points to a positive effect for physical workers who retire with disability pension or benefit (Hult, Stattin, Janlert, & Järvholm, 2010). Using longitudinal data of civil servants retiring at age 60, no effects on health were observed, but a small positive effect on mental health of higher socio-economic status groups (Mein, Martikainen, Hemingway, Stansfeld, & Marmot, 2003). However, the decision to retire early is often tied to an individual's health. Accounting for the problem of endogeneity of retirement behaviour and health by using early retirement windows as a retirement instrument, i.e. incentives to retire at a certain time offered by employers which are exogenous to employees' health, Norma and Lindeboom (2008) present evidence indicating an absence of an effect of retirement on health, implying there is no relationship between labour market participation and longevity.

While there is no evidence that cognitive function strongly declines in healthy adults aged under 65 years (see Baltes, Lindenberger, & Staudinger, 2006), Adam, Bonsang, Germain and Perelman (2007) show cognition to decline after retirement, due also to loss of social contacts and mental challenges that come with work. However, they also find that all occupational and many other activities during retirement can positively influence cognitive functioning and thus partly absorb the loss of stimulation caused by the retirement act. In fact, many older adults are motivated to continue work after reaching retirement age because they feel the positive impact of activities and social contacts on their well-being and cognitive functioning.

1.4 Age and motivation to work

While early retirement around the age of 50 is often related to lack of health or motivation (McNair, 2006) and also to a lesser degree due to (mostly women's) caring responsibilities (Evandrou & Glaser, 2003), empirical evidence suggests those who retire later can be grouped into those who either work because they are professionals strongly tied to their jobs and the associated appreciation, social status, and network, or those who hold rather low-skilled jobs and mainly have financial motives to work, having to support themselves or their family (Clayton, 2010; Smyer & Pitt-Catsouphes, 2007). Career motives play a lesser role, as research on individual goals shows (Elliot & Church, 1997). In a similar vein, the meta-analytic study by Kooij, de Lange, Jansen, Kanfer, and Dikkers (2011) finds age and intrinsic work motives to be positively related, whereas age and strength of growth and extrinsic motives are negatively related (similar Ng & Feldman, 2010). Empirical validation of the motivational trait taxonomy by Kanfer and Ackerman (2000) also shows middle-aged and older workers to exhibit less appetitive motivational traits, i.e. achievement-oriented motivation such as desire to learn, mastery and competitiveness. While Kanfer and Ackerman (2000) suggest using motivational interventions aimed at compensating for low motivation rather than trying to reanimate it, it can be argued that neither is a solution. Rather, while work motivation does not necessarily decline with age, it is work motives that change and shift priorities as individuals move through different phases of their lives and developmental stages (Inceoglu, Seger, & Bartram, 2012; also Stamov Roßnagel & Hertel, 2010).

As achievement-oriented work motivation is closely tied to the pursuit of career goals that are more salient in younger years, older workers' work motivation stems from less future-oriented, more affective factors such as the satisfaction they gain from enjoying their work, being with their colleagues and from feeling appreciated and useful to their organisation and society. However, the question whether lower achievement-oriented work motivation is the cause of employers' reluctance in offering older workers career and development opportunities or vice versa is hard to answer and likely the causality goes both ways.

Deconstructing the impact of age on work motivation, Kooij, de Lange, Jansen and Dikkers (2008) offer a literature review of several age constructs including chronological (i.e. calendar) age, functional (i.e. performance) age, psychosocial or subjective (i.e. as perceived by

others or oneself, respectively) age, organisational (i.e. organisational tenure) and life span age (indicating life-stage or family status). They find that the most commonly used age measure, chronological age, has a negative impact on work motivation mainly as it triggers retirement and still rather negative HR policies for older workers such as withdrawal of continuing education and reduction of working hours. While the psychological aspect of functional age yields inconclusive results, biological age and the associated physical decline have a negative impact on work motivation. Self-perceived age also has a negative impact on work motivation through its negative relationship with self-image and self-efficacy. Social age is more complex and contingent on age stereotypes in a person's social environment, but is also found to have a negative effect on work motivation. If perceived to be old by management, workers are less likely to have a promising career path ahead of them. At the same time, their social environment might expect them to retire, as they are 'old', even though the individual may feel otherwise. The effect of organisational age on work motivation remains unclear – positive effects may result from increasing wages and increased career resilience (becoming better at resisting barriers and achieving goals) on the one hand but a negative effect may arise through increasing career stagnation, detachment from one's career as goals have been achieved or seem unattainable and increasing skills obsolescence. Life-span age proves inconclusive, too. On the one hand, leisure time becomes more valuable with age, negatively impacting work motivation; on the other hand, the partner's preferences and retirement decision are strong influences, too.

While age concepts are interrelated, one can differentiate between the negative effects observed: cognitive abilities, self-perception, and organisational age mainly have an influence on continuing work; while chronological age, physical health, social perception, and life span age mainly influence the termination of work (Kooij et al., 2008). In the following sections chronological age is used as indicator for age as it allows best for comparison with other research, which mostly uses chronological age.

1.5 Development of older workers

Prolonging working life in times of fast-paced technological and organisational change more than ever depends on individuals' ability to continually master new knowledge and skills to stay employable and retain work ability. However, many employers still prefer to employ younger individuals who they suspect to possess more up-to-date knowledge (Boockmann & Zwick,

2004) rather than continually educate their ageing workforce. Acknowledging this reality, the OECD (Organisation for Economic Co-operation and Development) calls for organisations and unions to change their practices towards older workers, including offering better access to continuing education and decreasing discriminating practices (OECD, 1996). Here, organisations' human resource departments draw a considerable amount of attention. Not only do they have a critical role in recruiting older workers, they are also concerned with their retention and development.

A growing body of research thus examines their policies, actions, and attitudes towards older workers, as well as examining discrimination and exclusion of older workers. The department of human resource development plays a decisive role in the choice and allocation of continuing education opportunities. Human resource development may be a division in an organisation as well as a set of activities. According to Swanson and Holton, "Human resource development is a process for developing and unleashing human expertise through organization development and personnel training and development for the purpose of improving performance." (Swanson & Holton, 2009, p. 4). Werner and DeSimone define human resource development as "a set of systematic and planned activities designed by an organization to provide its members with the necessary skills to meet current and future job demands"(Werner & DeSimone, 2011, p. 537), thus making human resource development a subset of human resource management, which in turn they define as "the effective utilization of employees to best achieve the goals and strategies of the organization, as well as the goals and needs of employees"(Werner & DeSimone, 2011, p. 537).

In practice, there is a visible discrepancy between the acknowledged need for action on demographic issues articulated in public discourse and the lack of related policies and activities in organisations, a phenomenon also caused by an ineffective constellation of organisational stakeholders. Human resource management is rarely involved in organisational strategy and often has to deal with dwindling resources and competences, even though they manage an increasingly critical resource of the organisation (see Buss & Kuhlmann, 2013).

Research on older workers' continuing education often centres on age discrimination and perceived age-related differences and deficiencies. Differences between older and younger workers result from cohort-effects such as educational differences and age effects, e.g., declining physical abilities, higher levels of experience, but also from individual, legislative and organisational differences (Boockmann & Zwick, 2004). Some ageism may be hard to objectify.

Negative age discrimination in human resource development practices are rooted roughly in four basic age stereotypes: older workers cannot learn, older workers do not like to learn, they cannot handle new technology, and any investment in their human capital will not pay off as retirement draws near (see Gray & McGregor, 2003).

While it is undisputed that physical performance decreases with age, the same cannot be said universally for cognitive performance or motivation (Baltes et al., 2006). Choosing and implementing suitable training methods is crucial to the provision of adequate continuing education to older workers who have been found to show less mastery of training contents compared to their younger counterparts (Kubeck, Delp, Haslett, & McDaniel, 1996). Lower training effectiveness in terms of career development, earnings, adoption of new skills, flexibility, and job security was found by Zwick (2011), who consequently calls for a re-evaluation of the allocation of training contents and training forms for older workers. It is difficult however, to draw reliable conclusions from the few empirical studies on the interaction of age and training method and contents, as cohort effects are likely to factor into the equation.

It also needs to be noted at this point that the ability to learn itself needs to be nurtured throughout adults' lives, as disuse of abilities and also learning dehabituation are detrimental to life-long learning and training effectiveness. For instance, Wagner (2000) finds organisations prefer to assign older workers to old production processes yielding old products and younger workers to newer products and innovative processes. As a consequence, older workers who have spent years doing the same tasks and using the same skills do not only lose the ability to learn but also the scope of their qualification through lack of practice and new input. So a broader view on organisational practices also presents opportunities to sustain learning ability and human capital.

The stereotype that older workers do not like to learn will be treated in more depth in sections 2 and 3. However, older workers seem to rather proactively seek out continuing education in contrast to their younger counterparts who are luckier in being offered opportunities, this may in fact help older workers escape a disadvantaged position resulting from age discrimination (van Veldhoven & Dorenbosch, 2008). With previous education being a strong predictor for further education, which is in line with continuity theory, the relatively well-educated baby-boomer generation will likely bring an increase in older workers' demand for continuing education over the next years (Thompson & Foth, 2013).

However, research on why and what older adults wish to learn and how knowledge and skills are best conveyed to them is sparse and often limited as it does not focus on older individuals in employment, but rather on retirees. Also, the analyses often involve older individuals already enrolled in courses, thus being subject to selection bias. As will be elaborated in section 4, the motivational factors for activities such as continuing education and work may change over the course of a life span while aged heterogeneity increases. Those who still express a high career motivation at older ages do spend more time developing their career than those who pursue non-career goals (Greller, 2006). However, as long-term goals such as pursuing a career may appear increasingly unfeasible the less life years are ahead, enjoying social contacts and experiencing pleasant emotions tend to become more salient (Carstensen, 2006).

Thus, with regard to training contents, workers over 55 years of age are significantly less interested in courses aimed at achieving earnings increases, higher productivity, promotion, job security or adaptation to job changes (Zwick, 2011), but predominantly seek out education for reasons of cognitive interest and social contact (Boshier & Riddell, 1978; Kim & Merriam, 2004) as well as personal growth and satisfaction (Scala, 1996). However, while empirical evidence shows older workers on average to be less interested in long-term career goals, their preference for expressive (rather than career-furthering, instrumental) continuing education may in some cases be caused by a lack of career perspective that is often the result of age discrimination. Thus, further research on causality is warranted.

Cohort effects may also fuel the stereotype that older workers cannot handle technology. Technology adoption rates among different age groups still vary significantly (Mitzner et al., 2010) but may not represent age-related declines but rather cohort-specific obsolescence (Czaja et al., 2006). Attitudes toward computer technology seem to be shaped by the amount of associated familiarity and understanding (Karavidas, Lim, & Katsikas, 2005). Increasingly, continuing education involves using a computer and the internet. As courses may be conveyed, e.g., as a web-based seminar, participants need to possess sufficient computer and internet skills. Additionally, internet-navigation skills are also necessary for many forms of self-directed research and learning. Studies on the relationship of age and internet skills are inconclusive. However, the analysis of skill dimensions points to both younger and older adults showing a similar performance when it comes to information processing and evaluation skills, but younger adults tend to outperform older adults on the operational, technical, and formal domains (Litt, 2013). In addition to their different levels of skills and experience, older adults may suffer from

functional impairments such as visual and motor impairment, which taken together make using the computer and the internet more difficult and may result in frustration and demotivation (Kurniawan, King, Evans, & Blenkhorn, 2006). In order to increase older learners motivation for using technology, the technology's benefits should be stressed and computer anxiety and feelings of lower self-efficacy should be accounted for (Czaja et al., 2006).

Mather and Carstensen (2005) show older adults tend to process positive information more readily and effectively than negative information, so by creating a positive training climate that induces positive affect, the effectivity of training can be increased (see also Kanfer & Ackerman, 2004). In this vein, Kelley and Charness (1995) conclude in their meta-analytical study on the success of different methods teaching computer use, "The main challenge in designing an active training program for older learners is to provide enough structure that the trainee is not completely lost, while allowing him or her to engage in as much active exploration as possible." (Kelley & Charness, 1995, p. 115). Heldmann, Markgraf, Rodríguez-Fornell, and Münte (2008) also report good results of active, errorless learning settings for older adults. In sum, training for older training participants should be application-oriented (see also Lehr, 2000), providing positive, errorless activity settings while at the same time furthering social contact and allowing for interaction between participants (see also Gegenfurtner & Vauras, 2012).

Taking a wider view, research on older workers' continuing education needs to take into account the different learning histories of age cohorts. The deficit model of ageing still shapes perceptions of older workers, but a closer examination of other than biological causes of age-related deficits may yield more reference points for development (see Schöpf, 2007). Mertens (1974) identified curricula of formal adult education with their focus on object- and task-related facts, instruments, and methods that quickly face obsolescence as the main source of age-related deficits. Consequently, he proposes that ageless key competences should be taught, such as analytical and conceptual thinking, general problem-solving skills and technical fundamentals while everything specific should be taught on the job. While the concept of key competences has a strong impact on modern curricula, older generations typically had a more fact-intensive education. Consequently, Mertens (1974) points out that new educational elements that have proven themselves and been newly adopted in the educational canon typically represent the knowledge missing between generations and should be identified and taught in continuing

education. Unfortunately, from a macro perspective and compared to secondary and tertiary education, continuing education is not organised as systematically (Cervero, 2000) and curriculum contents are seldom based on intergenerational comparisons.

However, especially highly educated older workers have been found to employ very individual and also very self-determined strategies to acquire necessary knowledge and skills. So instead of only focussing on the provision of the 'right' kind of continuing education for these older professionals, employers are well advised to respect their autonomy and particular approaches to learning (see Fenwick, 2012).

The question whether continuing education for older workers pays off is hard to answer empirically. While the amortisation period for any human capital investment grows shorter with workers' age, it can be argued that this amortisation period will at least be realised as older workers' turnover is low, whereas younger worker are likely to move on to other employers, taking their knowledge with them (see Gray & McGregor, 2003).

In the following empirical analyses, motivational aspects of older workers' continuing education as well as work context and life-span related influences are analysed. Furthermore, a sociological perspective is included in the following section, as "sociological considerations play as important a role as psychological factors in finally determining the likelihood that people will try to learn."(Courtney, 1992, p. 80).

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2. The role of training motivation for work ability and the desire to work past retirement age

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Abstract: Germany, relying on a pay-as-you-go pension system, has increased regular retirement age to 67 due to its ageing population caused by decreasing birth rates and increasing life expectancy. Using data from the nationally representative 'Survey on continuing in employment in pensionable age', we investigate the relevance of training motivation for work ability and the desire to work past retirement age and whether differences between social groups reflect inequalities in training participation. Results show significant positive correlations between continuing training motivation and work ability and desire to work past retirement age. Differentiated for selected respondent groups the level of qualification has a significant influence. This effect was stronger than any differences with regard to gender or employment participation. Results imply external conditions only partly explain older workers' work ability or desire to work past retirement age. Compared to inequalities in training participation, motivation for continuing training is high across analysed subgroups.

Keywords: training, older workers, work ability, retirement, motivation

2.1 Introduction

Due to low fertility and increasing life expectancy in Germany the population is ageing as well as shrinking (Börsch-Supan & Wilke, 2009). The Federal Statistical Office in Germany foresees that the percentage of older people (65+) will increase from around 20% in 2010 to 28% in 2030 (Statistisches Bundesamt, 2009). At the same time, the population of working age will be reduced by 6.5 million until the year 2025 (Bundesagentur für Arbeit, 2013). Since these changes will have consequences for the economy and social security system the German government developed strategies to compensate these effects. Especially the pension system, organised as

a pay-as-you-go system, needed reforms. Hence, in 2008 it was decided that starting in 2012 retirement age will be raised stepwise from 65 to 67. Furthermore, the German government put into action the first demographic strategy called 'every age counts' with six fields of action. One of these fields is 'Keeping workers motivated, skilled and healthy' (Federal Ministry of the Interior, 2012). This accompanies the paradigm shift from widespread pre-retirement regulations to a prolonged working life. As a consequence, it is important to understand if individuals of the age of 55 and older would be willing and able to continue working even beyond retirement age. It can be shown that continuing training helps to keep people employable (e.g., Kenny, English, & Kilmartin, 2007; Staudinger & Heidemeier, 2009) and that upon reaching retirement age, individuals are still in rather good health with years of active time to spend (Tesch-Römer, Heribert, & Wurm, 2006).

This observation is reflected in our data source, the nationally representative survey on older workers' attitudes towards working life conducted by the German Federal Institute of Population Research in 2008 (fully described in Büsch, Dorbritz, Heien, & Micheel, 2010) that found 47.3% of respondents aged between 55 and 64 years prepared to work past traditional retirement age. As this figure leaves room for improvement we seek a deeper understanding of factors determining the wish to work past retirement. Earlier work (e.g., Blancke, Roth, & Schmid, 2000; Bretschneider, 2007) points to lifelong training as an important determinant allowing for individual task and job mobility, and for leading an independent working life. Another closely related factor is work ability, enabling individuals to maintain and update knowledge and skills, thus staying employable. Therefore, this paper aims to give insight into the role of continuing training motivation for work ability and the desire to work past work retirement age. As both work ability and training participation have been shown to differ across social groups we also analyse possible group differences.

This paper makes a new contribution to the literature because it highlights the role of training motivation for staying employed at a later age. As a consequence, organisations and policy-makers are challenged to establish motivation-enhancing work environments that follow a life span approach to instilling and promoting learning and training motivation. The paper is structured as follows: First a general description of continuing training and participation in Germany is given, with insight into motivational aspects, outcomes of continuing training (work ability and desire to work past retirement age) and a brief discussion of social heterogene-

ity in participation. Second, we conduct multivariate analyses to test our proposed relationships and discuss results with regard to previous findings on the subject. Third, the paper concludes with suggestions for organisations and policy-makers.

2.2 Continuing training

Continuing training denotes institutionalised further education during adulthood either sought out by the learner or part of work, which is non-formal, i.e. not part of a nation's qualification framework (see Commission of the European Communities, 2006). Molloy and Noe define continuing learning as "career-related acquisition of knowledge, skills and abilities, occurring as a result of either systematic planning or chance events, which may facilitate adaptation to talent market dynamics." (Molloy & Noe, 2010, p. 493).

Current career-related knowledge and skills may be conveyed in the form of continuing training (e.g., in classes and seminars), which in Germany is usually provided by the employer using resources of the organisation or using external providers of education. Individuals also participate in continuing training on their own accord and outside of the organisation. Career-related knowledge can also be acquired informally, e.g., through 'learning by doing' or exchange with colleagues. Indeed, the question who should be providing career-relevant training to the labour force and at what cost is controversial as it is closely connected to the development of social inequalities. Historically, many necessary job skills were gained on the job along with an early job entry, and long years of schooling being a rather modern development (see Mincer, 1962).

In Germany, participation in continuing training has been increasing steadily, with a phase of consolidation in the past decade. For 2012, the Adult Education Survey reported 49% of Germans (25.1 million German individuals between 18 and 64 years) who had partaken in continuing training that were mostly induced by the employer, directly job-related and took place on average twice a year (Bilger, Gnahs, Hartmann, & Kuper, 2013). Participation differs by person- or work-related factors, e.g., age, gender, contract duration, task level or level of qualification. If corrected for employment participation, women train as much as men or even more although both sexes participate less in continuing training as they age, especially if employed in small-sized firms (Huber, 2009). Indeed, employment participation seems to play an important role: having a fixed-term contract or a part-time job has a significantly detrimental effect on

being offered vocational training opportunities (Wilkens & Leber, 2003). So does qualification level: highly qualified individuals are twice as likely to partake in continuing training than those with the lowest qualification level (see Bilger et al., 2013; similar Bassanini, Booth, Brunello, de Paola, & Leuven, 2005). Job complexity and task level are even better predictors of training participation, with manual routine tasks resulting in the lowest level of participation (Görlitz & Tamm, 2012; similar Pischke, 2001). Some propose that routine workers' lower continuing training participation is due to a preference for learning by doing and learning in informal settings (see Wittpoth, 2009; also Görlitz & Tamm, 2012) which might be more suitable to acquire manual aspects of work, or due to exam anxiety based on negative educational experiences (see Fouarge, Schils, & de Grip, 2013). But these explanations neglect issues of selection and discrimination against subgroups in the workforce, keeping those who are in fact motivated to train from doing so.

With regard to age, only 29.4% of the 55–64 year-olds did not participate in continuing training during the past three years (see Büsch et al., 2010). Nevertheless, participation in that age group is still the lowest relative to other age groups, even if only employed individuals are analysed (see also Fitzenberger & Mühler, 2011). Continuing training participation is significantly higher among the 55–64 year-olds in other countries (e.g., 69% and 70% in Norway and Sweden, respectively; Bannwitz, 2008) that have different incentive systems (e.g., time banking options) promoting training participation, indicating that motivational factors may play a part in determining continuing training participation. Furthermore, cognitive ageing research shows there is no strong decrease of cognitive functions in healthy adults aged under 65 years (see Baltes, Lindenberger & Staudinger, 2006), so decreasing learning abilities are probably not a factor.

2.3 Continuing training motivation

Individuals are increasingly expected to become active on their own behalf, displaying the ability to self-organise themselves as an indicator of their professional competences (Dienel & Willke, 2004). This 'lifelong learning', or 'self-directed learning' (Garrison, 1997) is one precondition to achieve and retain 'employability' on the labour market (Europäische Kommission, 1995). Thus, an individual's affinity towards continuing training has become a point of interest in e.g., job interviews and is perceived as an important factor in holding a job (Vollmer, 2012).

Continuing training motivation is determined by contextual as well as personal factors (Mathieu & Martineau, 1997; Colquitt, LePine, & Noe, 2000) such as achievement motivation (Mathieu, Martineau, & Tannenbaum, 1993), self-efficacy (Van Erde & Thierry, 1996) or job-related personal factors such as job involvement, organizational and career commitment (Colquitt et al., 2000). Generally, interest in continuing training is high, but decreases with age (see Berg, Elders, & Burdorf, 2010; also Schröder & Gilbert, 2005; Hansen & Nielsen, 2006). For individuals 50 years or older, the most important reason for not participating in training is lack of obligation (Huber, 2009), implying, possibly, a lack of motivation. It has been surmised that older workers experience diminishing learning skills, negatively affecting their learning motivation and perceived self-efficacy (Dworschak, Buck, & Schletz, 2006). But as there is hardly any decline in cognitive functioning in healthy adults under 65 years (see Baltes et al., 2006), declining learning abilities do not seem to explain this motivational drop. Expecting a poor pay-off for training may also contribute to lack of training motivation among workers with decreased work ability, as they are more at risk of premature departure from working life and thus feel less motivated to invest in their career (Berg et al., 2010).

Training motivation strongly influences training outcomes (Schiefele & Schreyer, 1994). As participants' motivation to learn is "influenced by beliefs concerning effort-performance and performance-outcome relationships, career/job attitudes, and reactions to skill needs assessment" (Noe, 1986, p. 743), training participants with similar abilities are likely to be more successful at acquiring knowledge, being able to change behaviour, and effectively using that knowledge in their work if they are motivated (Noe, 1986). This implies that training has a stronger effect on work ability if individuals are motivated.

2.4 Outcomes of continuing training motivation

In our analysis we focus on work ability and desire to work past retirement age as outcomes of continuing training motivation. As workers need both physical and mental abilities that match job demands to perform their tasks successfully, the term 'work ability' depicts a balance between job requirements and individual characteristics, such as health, knowledge, skills or motivation (Berg et al., 2010). Work ability seeks to measure, "How good is the worker at present, in the near future, and how able is he or she to do his or her work with respect to the work demands, health and mental resources" (Ilmarinen, Tuomi, & Seitsamo, 2005, p. 3). Follow-up studies

(von Bonsdorff, Huuhtanen, Tuomi, & Seitsamo, 2010) found that lower work ability predicts earlier retirement between ages of 55 and 65 (see Sell, 2009, also Hopsu, Leppänen, Ranta, & Louhevaara, 2005), and the reverse (Salonen, Arola, Nygård, Huhtala, & Koivisto, 2003).

On average, work ability declines with age, although with decreasing stability (Ilmarinen et al., 2005). On an individual level, this effect is due to different personal biographies, health, training level or individual coping strategies employed to counter age effects. Additionally, there is the effect of the different organisations on workers throughout their occupational biographies (Dworschak et al., 2006). For older adults aged 55–64 health and functional capacities as well as work factors influence work ability most, while competences, values, and attitudes play a lesser role that further decreases with age. Gender differences are minor (Ilmarinen et al., 2005), but there is a difference between individuals working physically as opposed to cognitive workers, with the latter enjoying higher work ability (see Tuomi, Huuhtanen, Nykyri, & Ilmarinen, 2001).

Education science has brought forth various theories on self-directed learning and learning motivation, focussing on goal- and content-related conditions as well as interest-related aspects of learning. Within the latter, person-object-theory focuses on an individual's interest that is directed towards a certain subject, motivating the person to learn more about it and gain relevant skills and abilities (see Krapp, 2005). With this interest comes a positive emotional association, reinforcing the learning process. Similarly, self-determination theory hypothesises that intrinsic or extrinsic motivation lead to different outcomes in terms of quality of emotional experience as well as differing quality of knowledge acquired. As training motivation activates people to seek out training, learn and apply training contents to their work environment (see Beier & Kanfer, 2009; Noe, 1986), we expect continuing training motivation to be positively related to work ability:

H1: Individuals who are highly motivated to train also ascribe to themselves higher work ability.

While work ability is a desired outcome of continuing training it is also a necessary precondition for working past retirement age, along with the desire to do so. The general desire to work past retirement age is high: almost half of those aged between 55 to 64 can well or rather well envision working past retirement age (Büsch et al., 2010). Studies indicate that upon reaching retirement age, individuals are still in rather good health with years of active time to spend (Tesch-Römer et al., 2006). Still, blue-collar-workers in physically challenging jobs go into pension on average 8 years before white-collar workers. They also give health as the main factor

for leaving work life, while the latter usually work until legal retirement age (Statistisches Bundesamt, 2014; also Berg et al., 2010).

Retirement is less an event but a process that starts long before the actual act takes place. It is rooted in environmental factors, such as job characteristics (see Brusch & Büsch, 2012) or marital life and personal factors such as physical well-being, financial and skills status (Beehr, 1986; also Shacklock, Brunetto, & Nelson, 2009). Indeed, there is evidence that those motivated to work longer years can be broadly separated into two groups, those who need to work longer due to financial needs and those who enjoy their work so much that they do not wish to stop (at least not completely, see McNair, 2006). Here recognition and management and team support play major roles (Saba & Guerin, 2005; also Van Dam, van der Vorst, & van der Heijden, 2009). Those who see themselves working past retirement age wish to pass on knowledge and experience to younger workers, they also cite fun at work as a main reason and that it helps them to stay fit. They feel strongly connected to their workplace and tend to feel too young to retire. Those who do not want to continue working give physical hazard at work and hard or monotonous labour, stress and bad health as the main reasons. Organisational offers such as training opportunities and special age-friendly work equipment do not seem to have a profound effect on prolonging working life (Boockmann, Fries & Göbel, 2013). It would seem likely that a person with high continuing training motivation would also express the desire to work past retirement age as it may bring new experiences and knowledge and provide the opportunity to apply or transfer knowledge and gain recognition. We thus posit:

H2: Individuals who are highly motivated to train also feel more inclined to work past retirement age.

In line with our argumentation we also propose that the quantity of trainings taken is not relevant for the desire to work past retirement age (see also Boockmann et al., 2013):

H3: The actual number of continuing trainings taken has no effect on the desire to work past retirement age.

Nevertheless, the desire to continue working past retirement age may not always result in an opportunity to do so: many organisations rather lay off older workers or do not even hire them – negative age-stereotypes are still in place and hard to eradicate, even if proven wrong (see Baltes et al., 2006; Schulz & Stamov Roßnagel, 2010).

2.5 Social heterogeneity in training participation

As the workforce in Germany is ageing steadily and pension age has been raised so as to sustain the pension system, a substantial amount of research is focused on organisational and political barriers and drivers of older workers' inclusion in continuing training in order to maintain their employability. In Germany, socio-demographic and socio-cultural characteristics still influence educational participation and outcomes, so educational inequalities are present (see Hradil, 1999), as can be seen in numerous group-related incidents of inequality in continuing training participation, e.g. ,employment-related, gender- or age-related (e.g. Bilger et al., 2013). Early educational (dis)advantages often permeate individual life-spans, influencing further educational and career paths and life choices (see OECD, 2002).

Analyses against the backdrop of social stratification seek to understand "who gets what and why"(Alexander, 2001, p. 169). The concept of social stratification involves the "classification of people into groups based on shared socio-economic conditions" (Barker, 2003, p. 436) and the development of a vertical and horizontal differentiation between these groups with varying access to resources. Although the reality and the beliefs about this structure are passed on between generations, they are indeed changeable (Macionis & Gerber, 2010).

According to Tippelt and von Hippel (2005), different social milieus and social strata show differences when it comes to continuing training. Social circumstances and behaviour lead to different lifestyles, which can be understood as a framework for individuals' behaviour and identity, characterised by relative stability (on lifestyle sociology see also Lüdtke, 1989). The upper/middle social strata, represented by postmaterial and modern performer milieus is rather well-educated with good income – their training participation and learning motivation are the highest. The lower/middle social strata, represented by consumption-materialists and hedonist milieus with generally lower income and less education perceive learning as more of a strain, often based on previous negative experiences in their education, but also due to often unfavourable working conditions (e.g., shift-work) or financial limitations.

While there is evidence that, e.g., belonging to a lower social stratum is negatively related to participation (and sometimes success) in education or training, the effect on training

motivation may be the opposite (see e.g Walter & Stanat, 2008), as training or education might be, e.g., perceived as a means of improving one's less advantageous position in society or the workplace.

Job-related continuing training is usually offered and (at least partly) paid for by the employer, so the question of employers' selection criteria of training participants also needs to be examined. Human capital theory provides a framework explaining why an employer might hesitate to invest resources in e.g. older or female employees as the pay-off of that investment might seem risky – e.g., women might get pregnant and leave their job, temporary workers might soon move on to their next job, older employees are facing their retirement. Closely connected to that, negative discrimination and stereotyping with regard to age, gender or other socio-demographic variables are still prevalent in the workplace (on age stereotyping see, e.g., Amrhein & Backes, 2007). For older workers this might be the belief that their learning abilities and motivation have diminished, part-time workers are suspected that they do not invest as much energy or commitment in their work as full-time workers and so on. These attitudes and beliefs may have been proven wrong, but as they have been formed over decades, they seem just as hard to change.

Furthermore, participation may also depend on other factors such as informal obligation, social pressure, or legal, union or company regulations that come along with a particular status, level of qualification, making participation in continuing training more or less likely (see Wittpoth, 2009). Finally, it needs to be questioned if training participation is a positive end in itself, meaning that lower participation is generally perceived negatively and in need of improvement. Arguably, non-participation can be found in all socio-demographic groups, implying that people have different ways to handle their work and life environments, with classical classroom-based vocational training being only one possible way and, e.g., learning by doing another (Görlitz & Tamm, 2012).

Just how much of the differences in participation are rooted in involuntary exclusion may be approached by assessing the existence of corresponding group differences in continuing training motivation. According to lifestyle theory, learning motivation is more prevalent in mi-

lieus of the upper stratum, characterised by e.g., higher levels of qualification. Thus, this analysis also looks into the moderating role of socio-demographic variables, such as gender, employment participation (e.g., working hours and contract duration) or level of qualification:

H4: Continuing training motivation varies among different socio-demographic groups.

We also expect significant group differences when it comes to the relationship between continuing training motivation with work ability and with the desire to continue working past retirement age. Since groups with less employment participation – who are often women (Kümmerling, Jansen, & Lehndorff, 2008) – will face larger barriers to training participation than others, lack of training opportunities will lead to lower work ability, even if they are highly motivated to train. With regard to the desire to continue work after retirement age, part-time workers may already face less recognition at work and their financial gain through work is comparably low. For temporary workers, lack of recognition but also lack of opportunity may be detrimental to continuing work. We thus hypothesise:

H5: Social group influences moderate the relationship of continuing training motivation with work ability and the desire to work past retirement age.

2.6 Empirical Investigation

Our empirical analysis is based on interviews collected as part of a larger study (Weiterbeschäftigung im Rentenalter. Wünsche—Bedingungen—Möglichkeiten, English: Survey on continuing in employment in pensionable age, short: Weiterbeschäftigungssurvey), commissioned in 2008 by the German Ministry of the Interior and conducted by the German Federal Institute of Population Research, which is fully described elsewhere (see Büsch et al., 2010). By means of methods of multivariate analyses, we test the influence of continuing training motivation on work ability and the desire to continue work after reaching retirement age. Additionally, we test if there are significant group differences with regard to gender, level of qualification, working hours or contract duration.

2.7 Data set and collection

The Weiterbeschäftigungssurvey aims to provide insights on factors that play a part in working past retirement age. For the survey 1,500 employed individuals (workers, employees, civil servants, the marginally employed, and those in job-creating and structural adjustment measures) aged 55 to 64 were voluntarily and anonymously questioned on work, health and retirement via computer-assisted telephone interviews. The survey excluded pensioners, the unemployed, seasonal workers, short-term-workers, and workers in part-time employment prior to retirement who are already released. The sample was selected from a population of 3.8 million people, representing 40.6% of this age group, 7.4% of all persons aged 18 to 64 and 4.7% of the total German population in the annual average of 2006.

The realised sample is not representative for the older population in Germany, although intended. This is most apparent with regard to disposable income: Most male respondents (37.5%) belong to the highest income group (3,000€ and more), female respondents also find themselves in higher income groups (28.9% with a monthly disposable income of 2,000€ - less than 3,000€). Male median income is 2,620€ and female median income is 1,980€.

75% of respondents were under 60 years old and 44.4% were female. Most respondents work in small (10–49 employees) or medium (50–249) enterprises (each almost 25%). The majority worked in the educational, social or health sector (25%), followed by manufacturing industry (22%) and other services (22%). The sample consists of blue-collar workers (24.5%), white-collar workers (63.5%) and civil servants (12%).

The following analysis focuses on white-collar workers only, so a subsample of 953 employees will be used for our further analysis. From the survey we obtained three items to measure continuing training motivation: 'Continually learning new things is very important in my life', 'I shall always strive to continually train', and 'I like to attend continuing training classes' rated on a 5-point Likert-type scale (with 1='fully applicable' to 5='not at all applicable'), achieving an acceptable Cronbach's α of roundabout 0.7. Work ability is directly measured by asking respondents to self-assess their current work ability, their work ability five years ago, and predicted work ability five years from now. All three items used again a 5-point Likert-type scale (with 1='very high' to 5='very low') and achieved a Cronbach's α of 0.628. Desire to work past retirement age was measured by the single item: 'Would you like to be working after reaching official

retirement age, e.g. in minor employment?' Respondents answered on a 5-point Likert-type scale (1)=yes, (2)=rather yes, (3)=don't know, (4) rather no, (5)=no. As control variables we used gender, working hours, contract duration and level of qualification.

Working hours as per contract are captured by asking respondents to categorise themselves as either part-time (15–35 hours/week), full-time (35 hours/week or more), marginally employed (less than 15 hours) or unemployed. Contract duration was measured by asking, 'Is your work contract temporary?' with respondents answering either yes or no. Level of qualification was also self-rated, answering the question, 'What is your level of qualification?', selecting among the options 'no vocational graduation', 'Apprenticeship or similar', 'Master craftsmen/technicians or similar', 'Graduates of universities or of universities of applied sciences', or 'Other graduation'. Respondents were also asked to give the number of continuing trainings taken during the past three years.

2.8 Data analysis and results

In Table 2-1, the main results regarding the desire to work past retirement age, work ability, and continuing training motivation are given as mean values (standard deviation; 'std. dev.'). Here, the analyses are separated for different respondent groups and are enhanced through a test of significance for the most important intrinsic training motivation (with a t-test in case of two group levels and an F-test in case of more than two group levels).

In general, continuing training motivation is quite high (with an overall mean of about 1.8) – in contrast to a moderate work ability (about 2.2) and desire to work past retirement age (about 2.5). The high training motivation of our older sample seems in accordance with the theory of age-related motivational maintenance which posits that in the course of a life-time learning motivation does not necessarily decline but stays high or even increases (see Gegenfurtner & Vauras, 2012). In addition, heterogeneity of continuing training motivation is quite low (standard deviation much lower than for the desire to work past retirement age). Analysing different groups of respondents, male full-time employees with a fixed-term contract and the highest qualification level are most strongly motivated to train. However, only the difference for the differentiation with respect to qualification level is relevant from a statistical point of view ($p<0.001$).

Table 2-1: Main results differentiated for selected respondent groups

Trait		Work ability	Desire to work past retirement age	Continuing training motivation	
Parameter	**n**	**Mean (std. dev.)**	**Mean (std. dev.)**	**Mean (std. dev.)**	**t- or F-value (significance)**
Total sample	953	2.204 (0.572)	2.532 (1.188)	1.803 (0.854)	—
Men	411	2.131 (0.551)	2.471 (1.228)	1.797 (0.819)	–0.173 (0.863)
Women	542	2.259 (0.581)	2.578 (1.155)	1.807 (0.880)	
Full-time	689	2.132 (0.568)	2.533 (1.200)	1.771 (0.846)	–1.037 (0.300)
Part-time	208	2.360 (0.541)	2.585 (1.146)	1.841 (0.845)	
Fixed-term contract	54	2.225 (0.615)	2.038 (1.188)	1.704 (0.833)	–0.869 (0.385)
Permanent contract	898	2.202 (0.570)	2.561 (1.183)	1.808 (0.855)	
No vocational graduation	17	2.294 (0.539)	2.188 (1.167)	2.098 (1.110)	5.127 (0.000)
Apprenticeship or similar	444	2.247 (0.579)	2.590 (1.199)	1.919 (0.929)	
Master craftsmen/technicians or similar	195	2.189 (0.539)	2.521 (1.167)	1.720 (0.761)	
University Graduates	286	2.141 (0.586)	2.488 (1.192)	1.660 (0.747)	
Other graduation	11	2.212 (0.402)	2.091 (0.944)	1.848 (0.780)	

In a next step, the relationship between continuing training motivation and the other two traits, work ability and desire to work past retirement age, is analysed (Table 2-2).

Table 2-2: Correlation of continuing training motivation

Trait	Correlation of continuing training motivation with	
	work ability (using Pearson)	desire to work past retirement age (using Spearman)
Total sample	0.204**	0.116**
Men	0.287**	0.135**
Women	0.150**	0.102*
Full time	0.221**	0.133**
Part time	0.071	–0.010
Fixed-term contract	0.184	0.128
Permanent contract	0.206**	0.112**
No vocational graduation	0.018	0.450
Apprenticeship or similar	0.191**	0.117*
Master craftsmen technicians or similar	0.167*	0.126
University Graduates	0.245**	0.082
Other vocational graduation	0.042	0.272

Correlation of continuing training motivation with work ability and with desire to work past retirement age for selected respondent groups (**…significant correlations at the p<0.01 level, *…at the p<0.05 level)

For the total sample our analysis yields a weak significant positive correlation between continuing training motivation and work ability. A weaker significant correlation shows for continuing training motivation and the desire to work past retirement age. On group level, some small differences could be observed. Correlations for men are stronger than for women. Full-time employment is correlated to both work ability and desire to work past retirement age, whereas no correlations are found for part-time workers. Similarly, individuals with permanent contract again show weak significant correlations while there is no such effect for individuals with fixed-term contracts. With regard to qualification level the picture is more complex. For individuals without vocational graduation no correlations could be observed. While both correlations are found for the qualification level of apprenticeship, for master craftsmen only a very weak significant correlation for continuing training motivation with work ability is found. The strongest correlation with regard to qualification level is found for university graduates, also only for work ability.

Considering this data, a detailed analysis for men seems to be reasonable. Here, the analyses of the relationships of continuing training motivation with work ability leads to a Pearson correlation of 0.309 ($p<0.01$) and of continuing training motivation with the desire to work past retirement age to a Spearman correlation of 0.169 ($p<0.05$). But further analyses, e.g., linear regression analyses, showed no relevant relationships (i.e. very low R^2 values).

Confirming previous research (Boockmann et al., 2013), the actual number of trainings taken seems to have no effect on the desire to work past retirement age, as can be seen in Table 2-3.

Table 2-3: Correlation of actual trainings taken

Trait	Correlation of continuing training motivation with	
	work ability (using Pearson)	**desire to work past retirement age (using Spearman)**
Number of trainings	–0.067	–0.008

Correlation of actual trainings taken (within past three years) with work ability and with desire to work past retirement age (*…significant correlations at the $p<0.05$ level)

All in all, results confirm hypotheses H1–3, establishing a positive correlation between continuing training motivation and factors work ability and desire to work past retirement age, also giving renewed support to the relative unimportance of actual trainings taken for the desire to work past retirement age. Differentiated for selected respondent groups the level of qualification has a significant influence on continuing training motivation, giving support to H4. This effect was stronger than any differences with regard to gender, weekly working hours or contract duration. It is also apparent that group differences moderate the relationships posited in H1 and H2, thus supporting H5. As surmised, only full-time and permanent employees motivated to train also feel inclined to work longer years and feel higher work ability. Impact of qualification level seems limited to moderating the strength of the correlation of continuing training motivation and work ability, with the strongest effect for university graduates.

2.9 Discussion and conclusion

Focussing on white-collar employees aged 55 to 64 in Germany, the present study adds a motivational viewpoint to the literature of determinants of work ability and the desire to work past retirement age, also addressing issues of social inequalities and discrimination (with regard to, e.g., gender and qualification level).

First, our study shows continuing training motivation to be high, also across all respondent groups, with university-educated individuals being slightly more motivated, supporting Tippelt and von Hippel's (2005) findings. We show a weak significant correlation between continuing training motivation and self-assessed work ability, suggesting work ability as a pos-

sible outcome of training motivation similar to the findings of Krapp (2005) and Beier and Kanfer (2009). With regard to work ability the strongest correlation with continuing training motivation can be found for men, followed by individuals with university degrees. Methodically, one explanation for the relevance of qualification level might be that self-assessed work ability as measured in this study can be understood to mean both physical and mental ability to work. Less qualified workers might be working in more physically challenging tasks, so they possibility think more about their physical work ability when answering this question. Thus whether he or she likes to train and learn might have less effect on their work ability. It also lends support to findings on higher work ability for cognitive workers (Tuomi et al., 2001).

Furthermore, we show that it is indeed rather motivation for continuing training than actual participation that positively influences the desire to work past retirement age. Here, the strongest effect is also for men, but, interestingly, not for the university-educated group. This effect was stronger than any differences with regard to gender, level of qualification, working hours or contract duration for the three analysed constructs of work ability, continuing training motivation and desire to work past retirement age. Thus, our study shows that with higher qualification level the importance of continuing training increases. Hence, we can say that the stronger the culture of life-accompanying learning is set up for the purpose of managing the aging process and not age, the higher the ability as well as the desire to work past retirement age (see also Schulz & Stamov Roßnagel, 2010).

Even though results show the meaning of continuing training participation to be low for the desire to work past retirement age, without continuing training it can be assumed that the ability to prolong working life is low. In addition to this, positive training experiences can further increase training motivation. Hence, new methods and settings that accommodate the needs and expectations of older employees should be developed. Training contents for older training participants should be more application-oriented (Lehr, 2000) and more focussed on eliciting positive affect to increase motivation (Kanfer & Ackerman, 2004) as older individuals tend to direct their motivation more on personally meaningful and socially rewarding behaviours (Mather & Carstensen, 2005). Thus, trainings that further social contact and interaction have a positive effect on motivation (Gegenfurtner & Vauras, 2012). Additionally, the 'Weiterbeschäftigungssurvey' shows that for older employees a longer distance to the learning site leads to a lower continuing training motivation. Finally, it seems important that there is a continuing positive learning experience starting at a much earlier age, as learning histories and memories

do influence training perceptions and behaviour (see Tippelt & von Hippel, 2005). Thus, organisations would be wise to strengthen employees' training motivation by boosting their feeling of self-efficacy and valence not just in trainings but also generally at work and over a longer period of time (see Torraco, 1999).

While literature shows different socio-demographical groups to have different shares in continuing training participation we could show that generally, continuing training motivation is rather high (mean of 1.80), with hardly any differences between groups (only the difference for qualification level is statistically significant). This could imply that inequalities in participation are less a result of varying motivation among these groups, but of other barriers. As a first step, continuing training concepts should accommodate differences in interests and barriers of social milieus, as well as different learning backgrounds and expectations (see Tippelt & von Hippel, 2005). Negative stereotypes and discrimination need to be addressed, too, in order to create a supportive and appreciative organisational climate that fosters a learning culture. Consistent with the lifelong learning approach, it seems necessary to develop a life span approach to instilling and promoting learning and training motivation and avoid longer periods of non-training that may decrease learning abilities (Dworschak et al., 2006).

Finally, we address the limitations of our study. First, the realised sample is not representative for the older population (although intended), so it would be unwise to apply results to older employees in general. Second, causalities remain unclear. It could be argued for example, that someone who wishes or needs to stay employed after reaching legal retirement age feels motivated to train because he or she feels the necessity of continuing training for keeping the job – rather than assuming that individuals who like to train are also e.g. more interested per se in working longer years. Third, our measures lack a focus on any particular type of continuing training, so we cannot safely assume that any continuous training motivation measured is actually aimed at on-the-job training. As reliability of the scales used in the survey is modest, our correlation results could be biased and the effect size may be higher. Furthermore, answers to questions about work ability, continuing training motivation and desire to work past retirement age are subject to social desirability and may not represent the true attitude of the respondent. For future research it would also be helpful to analyse longitudinal data to understand how these relationships develop in the long run.

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3. Work context influences on older workers' motivation for continuing education

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Abstract: Decreasing birth rates and increasing life expectancy have led to the ageing of the German population during the past decades. As the German retirement pay system is a pay-as-you-go system, legal retirement age is increased step by step to 67 years. Long before individuals actually retire, environmental factors but also personal factors influence the path of the retirement process. Work ability can be maintained through continuing education. Understanding and possibly even increasing older employees' motivation to participate in continuing education is vital to achieving the European Union's aim of individuals' lifelong learning to cope with challenges of technological and organisational change. This empirical study analyses the influence of work context factors on motivation to participate in continuing education. Data source is the "Survey on continuing in employment after reaching pensionable age", commissioned in 2008 by the Bundesinstitut für Bevölkerungsforschung. Results show weak but significant influences of some work context factors. Recommendations for actions and further research directions are given.

Keywords: Continuing education, Life span, Motivation, Older workers, Organisation

3.1 Introduction

In these times of demographic change, organisations are facing new challenges. Decreasing fertility rates and increasing life expectancies make the labour force shrink and age (see Birg 2005; Börsch-Supan & Wilke, 2009) at the same time. As a consequence, the working age population has been calculated to decrease by 6.5 million until the year 2025 (Bundesagentur für Arbeit[1],

[1] German Federal Labour Market Authority.

2011), whilst worker mean age will rise to 41,7 years (Börsch-Supan & Wilke 2009, p. 41). In sum, these changes substantially affect Germany's pay-as-you-go pension scheme that relies on the younger generations paying for the retirees. One strategy to avoid inordinate contribution burdens for younger workers is to decrease the number of pensioners by prolonging working life (Bundesministerium des Innern[2], 2011). As a consequence, partial retirement is no longer subsidised in Germany; the labour force participation of people between 60 and 65 years old has grown from 25.9% in 2002 to 49.6% in 2012 (Bundesagentur für Arbeit, 2013). Additionally, in 2010, it was decided that retirement age will be increased stepwise to 67 years.

Against this backdrop, the question of individual motivation for prolonging one's working life arises. In 2008, a national representative poll on the attitudes towards prolonged working life by the German Federal Institute of Population Research (Bundesinstitut für Bevölkerungsforschung) indicated that 47.3% of people between 55 and 64 years were prepared to work past retirement age, a number regarded as rather high (Büsch et al., 2010). This suggests that research into the drivers of work motivation after age 65 is now needed. Earlier work (e.g. Blancke et al., 2000; Bretschneider, 2007) argued that lifelong education might be such a driver as it enables individual task and job mobility, and an independent (working) life. Therefore, we were interested in indicators of motivation to participate in continuing education (MPCE) as one of the support factors for work after age 65. As most continuing education is work-related, we aim to find out if and how work context factors influence older individuals' MPCE.

3.2 Theoretical background, current state of research, and hypotheses

As institutionalised but non-formal-education, continuing education features between formal education and informal learning. Whilst the former covers certificate programmes that are part of a national qualification framework (Commission of the European Communities, 2006, p. 19), the latter refers more to learner-led or work-integrated learning. Continuing education is a vital ingredient of lifelong learning, as it helps people build and maintain their employability and work ability by preparing them to meet the challenges of technological and organisational change (e.g. see Kenny et al., 2007; Staudinger & Heidemeier, 2009). Rising participation rates underscore the importance of continuing education. In Germany, participation has steadily in-

[2] German Federal Ministry of the Interior.

creased over the past decades, with some consolidation during the past 12 years (Bilger et al., 2013, p. 29). Most continuing education takes up a few hours to days and is set at the workplace (69% in 2012). Although participation has been increasing, a participation rate of 49% leaves considerable room for a further increase. Even though only 29.4% of the 55–64 year-olds did not receive any training in the recent past (see Büsch et al., 2010, p. 81), participation in that age group is still the lowest relative to other age groups.

In light of these findings, it is important to understand the factors that drive participation. In our paper, we focus on older workers' MPCE and the role of work context factors in shaping that motivation. In line with established theories of work and training motivation and recent empirical research (e.g., see Gegenfurtner & Vauras, 2012; Grant & Shin, 2011; Ng & Feldman 2012; Pinder, 1998), we refer to MPCE as the readiness to invest (cognitive, temporal, or behavioural) resources into work-related continuing education activities. As work context factors we consider factors outside individual workers, such as company size, work climate, or task level that might influence this motivation.

There are both empirical and practical reasons for our interest in work context influences on older workers' continuing education motivation. On the empirical side, there is evidence for a striking "motivational asymmetry". Whilst a recent meta-analysis (see Ng & Feldman, 2010) showed age to be positively related to intrinsic work motivation, job involvement, and commitment to one's organisation, negative relationships with age emerged for career development motivation and motivation to participate in continuing education in another meta-analysis (see Ng & Feldman, 2012). This suggests that a decline in MPCE might not be "normative" or "inevitable". Cognitive ageing research indicates that there is no pronounced decline in cognitive functioning in healthy adults before 65 years of age (see Baltes et al., 2006, also Büsch et al., 2010); declining learning abilities are therefore unlikely to play a major role. Work context, on the other hand, might well be important. Participation in continuing education is substantially higher in the 55–64 years age bracket in other countries (e.g., 69.0% and 70.0% in Norway and Sweden, respectively; Bannwitz, 2008, p. 10) where different incentive systems (e.g., time banking options) are in place that might foster MPCE. Also, there is evidence that older workers are at a par with their younger colleagues in learning competence if their company endorses a lifelong continuing education policy (see Schulz & Stamov Roßnagel, 2010). Studying work context influences seems important also in terms of practical implications. With a view towards large-scale company-driven or policy-driven interventions to promote participation, one of the

central questions is that of contextual drivers that would positively affect motivation for most workers. After all, workers differ widely in terms of personal factors, but might be exposed to the same contextual conditions. As individual interventions to increase motivation would be beyond the scope of policy measures, identifying major contextual factors that enhance motivation for the majority of workers is in order.

Despite ample research on MPCE (for a summary, see Colquitt et al., 2000), we know relatively little about age-related influences on that motivation. In their meta-analysis of the age-continuing education motivation relationship, Gegenfurtner and Vauras (2012) identified Socio-emotional Selectivity Theory (e.g., Carstensen, 2006) and Kanfer and Ackerman's (2004) expectancy framework of age differences in work motivation as two major theoretical underpinnings for models of age-related influences on MPCE.

In Kanfer and Ackerman's (2004) view, older workers' work motivation results from the interplay of one's appraisal of invested effort, resulting performance, and the utility of that performance. For instance, to the extent that continuing education involves learning new skills, it taxes cognitive capacity. As older workers might not achieve the same level of cognitive performance as their younger colleagues, the perception of having to increase effort might reduce motivation. Whilst such effort-performance appraisals might be shaped primarily by personal influences; performance utility perceptions might be susceptible to work context influences. These perceptions refer to the valence or attractiveness (i.e. utility) workers attribute to external rewards for participation in continuing education and thus reflect the influence of work context, i.e. "higher order variables that are perceived by individuals and influence their thoughts and actions" (Quinones, 1997, p. 181). Research has consistently shown both pre-education work experiences and an organisations' continuing education design to influence motivation (see Salas & Cannon-Bowers, 2001). Facets of training climate, such as reputation of training, intrinsic and compliance incentives and social support are typical contextual influences that predict pre-training motivation (see Facteau et al., 1995; also Kontoghiorghes, 2002). A contextual influence on older workers in particular results from supervisors' negative age stereotypes (e.g., supervisors' belief that older workers learn less effectively) that are detrimental for self-efficacy beliefs and thus motivation (see Van Vianen et al., 2011). Turek and Perek-Bialas (2013) showed that employers' views of older workers' training capabilities were associated with those employers' age management policies. Employers with more positive assessments had more con-

tinuous career development and internal job mobility schemes, and training plans. More negative assessments, on the other hand, went with a focus on "pushing out" older workers, including early retirement schemes and part-time retirement.

Socio-emotional selectivity theory (SST) is also helpful in modelling work context influences on older workers' motivation to partake in continuing education. SST is a specification of general models of developmental regulation (e.g., the Selection, Optimisation, and Compensation (SOC) model; see Baltes and Baltes, 1990) assuming that people strive to match their resources to external demands. According to SST, as people age and anticipate or experience a loss of physical and cognitive resources, they increasingly focus on the "time left" in their lives. As a consequence, their goal priorities shift. Relative to emotion-related goals linked to "harvesting" that can be realised in the short term ("here and now"), investments "in one's future", such as a focus on gathering information, on experiencing novelty, and on expanding skills and knowledge, become less attractive. Motivational selectivity increases (see Riediger & Freund, 2006) such that people narrow their goal set by selecting the subjectively most important goals and optimise their strategies for goal attainment in order to compensate for the experience of age-related loss and decline. In line with that reasoning, research on work motivation shows that older workers' focus of motivation shifts towards tasks and roles that draw on experience and on social skills for which older workers report higher levels of competence (see Stamov Roßnagel & Biemann, 2012). Consistent with the selectivity perspective, older workers seem to favour more practical and informal learning as opposed to classroom-based education, which they increasingly perceive as not effective for their work (see Zwick, 2012). Also, older workers' lower participation in continuing education has been explained with a low motivation to invest in activities that might not "pay off" anymore (see Warr & Fay, 2001). Whether or not continuing education pays off, however, is an appraisal that is shaped by organisational influences. To the extent that employers offer older workers fewer education opportunities and career development options (see Turek & Perek-Bialas, 2013, p. 658; Villosio et al., 2008, p. 49), those workers' utility perception of continuing education might be undermined.

It is important to note that despite SST's general assumption of skills and knowledge expansion becoming less attractive with age, the theory does not predict invariable age-related decline in motivation to participate in continuing education. Likewise, Kanfer and Ackerman's (2004) framework should not be taken to predict only motivation decline. As Gegenfurtner and Vauras (2012) pointed out, people increasingly direct their motivation towards personally

meaningful and socially rewarding behaviours (see also Mather & Carstensen, 2005). Kanfer and Ackerman (2004) also posit that older workers will show increased motivation for an activity (here: continuing education) if that activity incurs positive affect. Therefore, Gegenfurtner and Vauras (2012) suggest that continuing education designs that stimulate social contact and interaction might increase motivation. We posit that this consideration applies to other features of the education context, for instance, to the extent that participation is appreciated and rewarded regardless of age, MPCE might be high even in older workers as continuing education might convey rewards that are beneficial for positive affect.

Taken together, a variety of work context factors can be analysed within the motivational selectivity perspective outlined above. We start with company size that has been shown to be positively associated with participation in continuing education (see Bilger et al., 2013). Generally, working in larger organisations can induce higher competition among employees, increasing the utility of participation as a way to gain and maintain a competitive advantage. Adding to continuing education utility is the finding that larger organisations typically offer more development opportunities and that they tend to foster internal labour markets, making it easier for workers to apply new knowledge (see Hubert & Wolf, 2007). However, for older workers career motives have been shown to be of lesser importance when choosing to engage in continuing education. Therefore, we assume that,

H1: The relationship between company size and motivation to participate in continuing education is moderated by age such that motivation is higher in larger companies for younger, but not older workers.

Expected continuing education pay-off may be higher for individuals who are employed full-time as they will anticipate more career-related rewards at work (i.e. promotion to a higher qualified job or other benefits); they will therefore be more motivated. But the reasons why people become part-time workers are diverse. Many actually do seek full-time employment, in which case their motivation would not differ from that of full-time workers (see Feldman & Doerpinghaus, 1992). However, older part-time workers, who may already be in early retirement, just seek distraction, additional income or are "phasing out" of their jobs find career-related rewards less motivating. Therefore, we propose,

H2: The relationship between working hours and motivation to participate in continuing education is moderated by age such that motivation is higher in younger, but not older workers who work more hours.

Temporary workers show lower participation in continuing education (see Finegold et al., 2005; Bilger et al., 2013, p. 71). As Finegold et al. (2005) show, continuing education pays off for temporary workers: they experience wage growth and increased job stability. Thus it comes as no surprise that temporary workers' motivation does not differ much from that of permanent workers, if they seek to become permanently employed, which most do (see Wheeler & Buckley, 2001; Siemund, 2013, p. 163 ff). Older temporary workers have less need and a lower likelihood of attaining permanent employment, so we expect lower motivation:

H3: Older temporary workers have less MPCE than older permanent workers.

Workers on higher task levels participate about twice as often in continuing education than workers on lower task levels (Bilger et al., 2013, p. 69). However, as older workers on higher task levels may feel they have already reached a satisfactory career level they may attach less importance to their career goals and thus feel little motivation to engage in continuing education. Thus, we hypothesise,

H4: Older workers on higher task levels have less MPCE than workers on lower task levels.

Studies show that workers who feel their job to be at risk experience negative work attitudes and behaviour, including decreased work effort, trust, career satisfaction and career optimism (Roskies & Louis-Guerin, 1990, p. 356). Also, such workers tend to look for employment elsewhere (see Hasselhorn et al., 2003). Older workers have fewer alternatives; reemployment probability strongly decreases with age (see Chan & Stevens, 2001). Knowing this, and being more averse to negative affect due to an unstable employment situation, older workers seek to better their situation in their present workplace. Older workers who engage in continuing education have been shown to experience a higher security of employment (see Bassanini et al., 2005). For them, improving through education the security of their employment is a major determinant of the perceived utility of continuing education participation. So we assume,

H5: For older workers, MPCE is higher if perceived security of employment is low.

Under physically or psychologically stressful working conditions, the effort of selecting and pursuing educational activities can overtax workers' coping resources. For older workers in psychologically stressful working conditions however, an unexpected effect can be observed: job stress leads older workers to delay their retirement (Blekesaune & Solem, 2005, p. 25). A possible ex-

planation referring to Hans Selye's stress concept (Selye, 1974) is that older workers under stress feel more included and appreciated, which enhances their motivation. Therefore, we argue that,

H6: For older workers, physically stressful working conditions are a detrimental factor for their MPCE, whereas psychologically stressful working conditions increase motivation.

Finally, in line with Gegenfurtner and Vauras' (2012) assumptions on the social co-regulation of MPCE, we posit that a supportive climate among co-workers and supervisors increases the perceived utility of continuing education especially for older workers, given that a supportive climate goes with more positive social feedback and performance appreciation that become more important motivators with increasing age (see Baron & Stamov Roßnagel, 2010). Therefore, we propose that,

H7: The relationship between work climate and MPCE is moderated by age such that work climate fosters motivation more strongly in older than in younger workers.

Empirical evidence shows that more opportunities of continuing education go to men with longer tenure (for women, the picture is more complex, also due to often different work biographies, e.g., Becker, 1991, p. 362). Older workers, who have not been with an organisation for long, may feel more commitment than their younger counterparts, as it is more difficult for older workers to find new employment. Being aware of possible negative age prejudice, they demonstrate their abilities to reassure the employer and increase their inclusion in the organisational social system. We thus posit:

H8: For older workers, shorter tenure in an organisation is associated with higher MPCE than longer tenure.

Older age cohorts might have experienced fewer opportunities to qualify in their younger years (Beer & Wagner, 1997) and therefore participate less often in continuing training, this in sum is detrimental for learning-related self-efficacy beliefs and thus motivation (see Van Vianen et al., 2011). So we hypothesise that,

H9: Older workers who participated in continuing education in the past three years feel more participation motivation than those who have not participated.

According to SST, older workers whose career still has a relatively high priority in their goal set can be expected to invest a significant amount of resources in achieving this goal. Continuing education is an important factor in sustaining ones' employability and work ability. We thus posit:

H10: Older workers who envisage working past their retirement age also feel higher MPCE.

3.3 Method

We conducted multiple regression analyses to analyse the work context drivers of MPCE. We considered work context factors an important part of the various contextual factors that may foster a worker's motivation to participate in continuing education.

Designed as a cross-sectional study, the "Survey on continuing in employment after reaching pensionable age" focuses on factors related to the prolongation of employment past legal retirement age (see Büsch et al., 2010). 1,500 employees were recruited for this anonymous survey that was administered as computer-assisted telephone interviews. Participants were between 55 and 64 years old. People who were not in permanent employment (e.g., retirees, unemployed, seasonal workers, short-term-workers, and workers in part-time employment prior to retirement who had already been already released) were not included in the sample that was pulled from a population of 3.8 million people, representing 40.6% of this age group, 7.4% of all persons aged 18 to under 65 and 4.7% of the total population in the annual average of 2006. The main data sample was weighted with microcensus data from the year 2006 (Statistisches Bundesamt, 2008). Median income was 2,620€ for men and 1,980€ for women. 75% of respondents were under 60 years old and 44.4% were female. Most respondents worked in small (10–49 employees) or medium (50–249) enterprises (67,6% combined). With regard to industry, most worked in the educational, social or health sector (25%), followed by the manufacturing industry (22%) and other services (22%).

We used multiple regressions to investigate the most effective set of predictors of our dependent variable MPCE and include product terms to capture possible moderation effects of age. The survey provides our model's dependent variable (DV) MPCE, measured by three items: "Continually learning new things is very important in my life", "I shall always strive to continually train" and "I like to attend continuing training classes" rated on a 5-point Likert-type ordinal scale (with 1="fully applicable" to 5="not at all applicable"). We achieved an acceptable Cronbach's α (0.726) for MPCE and work climate (0.806) but a lower validity for both constructs of working conditions as can be seen in Table 3-1.

Table 3-1: General results for the main variables

Variable	Influence	No. of items	Mean (std. dev.)	Cronbachs α
Motivation to Participate in Continuing Education (MPCE)	–	3	1.919 (0.940)	0.726
Work climate	+	6	2.235 (0.913)	0.806
Physical Working Conditions	+	4	2.869 (0.921)	0.678
Psychological Working Conditions	+	5	2.295 (0.736)	0.617
Security of Employment	+	1	1.621 (1.017)	–
Task Level	+	1	2.543 (0.934)	–
Tenure	–	1	21.439 (12.491)	–
Age	0	1	58.328 (2.403)	–

General results for the main variables of the analysed sample (n=1,500; Legend: "–" ("+") … indicates, that higher values represent lower (higher) affirmation, "0" … indicates no re-coding influence, "–" … not applicable, "std. dev." … standard deviation).

MPCE is rather high among our sample (with a mean of 1.9 on a 5-point scale), supporting the theory of age-related motivational maintenance stating that over a life-time learning motivation does not generally decline but may stay high or even increase (see Gegenfurtner & Vauras, 2012). Respondents provided assessments of their work-context. A sample item of physical working conditions was "My work requires a high working pace". Psychological working conditions were captured with items such as "My work requires strong concentration". Work climate, defined as colleagues' and supervisors' behaviours that create a supportive and appreciative work atmosphere was captured with items such as "Nowadays it is important to have concern for other colleagues' needs". We also recorded sex, age, working hours, company size, security of employment, tenure, temporary work contract, task level, desire to work past retirement age and continuing education participation in the last three years. Respondents gave their gender (m/f), age (in completed life years), and categorised themselves as part-time (15–35 hours/week), full-time (35 hours/week or more), marginally employed (less than 15 hours) or unemployed to provide working hours as per contract. All items were rated on 5-point Likert-type ordinal scales from 1= "fully applicable" to 5= "not at all applicable" (see Table 3-5 for descriptive results of categorical data in the appendix).

3.4 Results

We investigate work context-related influences on older workers' MPCE using multiple regression analyses on a sample of 1,500 workers between 55 and 64 years old. This regression analysis allows us to find out which of the analysed factors influences MPCE most. Table 3-2 shows Spearman correlation coefficients for the main variables of our regression model. We observe some weak significant correlations. The highest substantial correlations for MPCE can be observed for Psychological Working Conditions and, slightly weaker, for Task Level.

Table 3-2: Correlations of main variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Motivation to Participate in Continuing Education (MPCE)								
(2) Work climate	0.093**							
(3) Physical Working Conditions	0.017	–0.209**						
(4) Psychological Working Conditions	0.196**	–0.181**	0.469**					
(5) Security of Employment	0.100**	0.203**	–0.104**	–0.024				
(6) Task Level	–0.176**	0.027	0.009	–0.245**	–0.089**			
(7) Tenure	0.023	0.026	0.027	–0.091**	–0.198**	0.155**		
(8) Age	-0.017	-0.082**	0.083**	0.040	–0.134**	0.073*	0.088**	

(Legend: *=p<0.05, **=p<0.01)

All in all, we find some small, albeit significant effects for our regression analysis, as seen in Table 3-4.

Table 3-3: Results of the regression

Variable	Unstandardised coefficients		Standardised coefficients	Significance	
	B	Std. error	Beta	T	p
Work Climate	0.046	0.027	0.053	1.676	0.094
Work Climate * Age	–0.022	0.027	–0.026	–0.836	0.403
Physical Working Conditions	0.001	0.033	0.001	0.026	0.980
Physical Working Conditions * Age	–0.028	0.031	–0.031	–0.886	0.376
Psychological Working Conditions	0.134	0.034	0.150	3.917	0.000
Psychological Working Conditions * Age	0.036	0.034	0.039	1.079	0.281
Security of Employment (dummy coded with 0=no; 1=yes)	–0.082	0.078	–0.033	–1.060	0.290
Temp. Work Contract (dummy coded with 0=no; 1=yes)	–0.064	0.116	–0.017	–0.553	0.580
Task Level	–0.120	0.029	–0.139	–4.124	0.000
Task Level * Age	0.026	0.027	0.030	0.968	0.333
Working Hours (dummy coded with 0=part-time; 1=full-time)	–0.050	0.065	–0.026	–0.762	0.446
Past Participation (dummy coded with 0=no; 1=yes)	-0.634	0.063	–0.312	–10.094	0.000
Company Size (dummy coded with 0=SME; 1=else)	–0.112	0.062	–0.058	–1.813	0.070
Tenure	0.118	0.028	0.136	4.237	0.000
Tenure * Age	–0.007	0.026	–0.008	–0.265	0.791
Desire to Work past Retirement Age (dummy coded with 0=1 or 2; 1=3 or 4)	–0.173	0.053	–0.101	–3.279	0.001
Gender (dummy coded with 0=male; 1=female)	–0.125	0.060	–0.072	–2.096	0.036

Our model explains 20.4% of MPCE's variance. The amount of variance explained is significant ($F = 13.475$, d.f. = 17, $p = <0.001$). Prior continuing education participation exerts the strongest influence on MPCE. Contrary to our prediction, we find that workers who received continuing education in this time frame experience less MPCE. An explanation could be that workers who received continuing education in the past, derive less utility from further trainings, especially if career goals lose salience. Consistent with our hypotheses, good psychological working conditions (i.e. low stress) positively influenced MPCE. Also, older workers on higher task levels indicated lower MPCE. This seems to be in contrast with empirical findings on higher task level workers' higher participation in continuing education (Bilger et al., 2013). Our findings may show either an age effect, only pertaining to older workers on a high task level. Alternatively, higher task levels might go with higher (mandatory) participation but also

with decreasing motivation, as older workers at higher task levels have attained most of their career goals. Our result lends some support to findings by Finegold et al. (2005), who found more MPCE in low-skilled individuals.

Counter to our hypotheses, tenure positively covaried with MPCE, which might be due to the fact that only 4.4% of survey respondents had been with their employer for less than 3 years, so very few were new to their company. Also, contrary to our assumptions, workers who wish to work past their retirement age feel less MPCE. It may be that those with a desire to work past retirement age have got a shorter future time perspective on work and do not really consider acquiring further knowledge through continuing education. We conducted a further test with only white-collar workers. Table 3-5 shows the statistics for our additional analysis, indicating that for white-collar workers the reverse is the case: those with a desire to work past retirement age feel a higher motivation for continuing education (a post-hoc Bonferroni-Test shows the difference between the "yes" and the "no"'group to be significant with $p<0.01$). So our hypothesis of older workers who envisage working past their retirement age also feel higher MPCE received partial support.

Table 3-4: Analysis of group differences

Desire to work past retirement age	**n**	**Mean (Std. Deviation)**	**Significance**
Yes	253	1.645 (0.757)	F=5.914; d.f.=3, p=0.001
Rather yes	222	1.757 (0.759)	
Rather no	171	1.831 (0.809)	
No	290	1.945 (0.996)	
Total	936	1.798 (0.854)	

Analysis of group differences in continuing education motivation with regard to desire to work past retirement age for white-collar workers (mean dispersion).

The relationships of the factors work climate, physical work conditions, security of employment, working hours, company size, and temporary work contract with MPCE point in the proposed direction but without statistical significance. The lack of significance for work climate and physical working conditions seems inconsistent with other research, e.g., on education environment influences (see Facteau et al., 1995). Yet by comparison, our scales for work

climate were not only focussed on education-related aspects. This broader view in our measures may partly explain our different results. A similar effect may pertain to our measures of MPCE, where items do not directly relate to job-related continuing education, so the effect of work context variables may be somewhat diluted by other influences. Age did not emerge as a moderator in our survey. One reason may be the narrow age range of our sample (15 years). Controlling for the factors analysed in our regression analysis, we can conclude that past participation represents the strongest predictive influence on older workers' MPCE. Furthermore, psychological working conditions, task level and organisational tenure play a role for predicting MPCE. A desire to work past retirement age is significant but plays a lesser role.

3.5 Discussion

This study adds to the literature of how to motivate older employees to take part in continuing education. Motivation to participate in continuing education (MPCE) has been identified as critical for lifelong learning and maintaining work ability over the work life course. Despite its importance, only few studies had looked at older workers' MPCE and its determinants. The contribution of the present study is in identifying work context-related motivational differences between older and younger workers. Our point of departure is the notion that MPCE is not only determined by personal factors, but also contingent on external factors, such as work context factors (Kanfer & Ackerman, 2004). Our research was inspired by Socioemotional Selectivity Theory, predicting shifting goal priorities with increasing age towards goals, which can be achieved in the nearer future and preferably induce positive affect. Consequently, our research questions were led by the expectation that older workers' MPCE differs from that of younger workers. More specifically, we hypothesised that work context factors influence MPCE differently in older workers than in younger workers.

We found MPCE to be rather high (with a mean of 1.9 on a 5-point scale), in accordance with the theory of age-related motivational maintenance stating that over a lifetime learning motivation does not generally decline but may stay high or even increase, a theory that has found substantial empirical support (see Gegenfurtner & Vauras, 2012). Whether or not individuals received continuing education in the past three years has the most influence on their MPCE. However, the relationship is counter to our prediction: Those who did receive

continuing education in the past three years had a lower MPCE. This points to a weaker effect of training on motivation than we assumed (see Van Vianen et al., 2011), and, as we speculate, to a decreasing utility of continuing education for older workers.

Confirming our hypothesis, older workers on higher task levels feel lower MPCE. This may seem at odds with empirical findings showing that in general, workers on higher task levels participate about twice as often than workers on lower task levels (Bilger et al., 2013). However, mandatory trainings may factor into the latter finding; also, these findings pertain to a wider age range. Drawing on our theoretical background, older workers on higher task levels may have already achieved a satisfactory career level and therefore attach less importance to their career goals, leaving them with less motivation to engage in continuing education.

The fact that we had to reject several of our hypotheses suggests that extending the theoretical framework might be needed in future research. Whilst SST is useful in deriving age-specific hypotheses on general motivation differences, it might be limited in accommodating some of the factors of relevance in training and development issues. One general issue, for instance, concerns the mandatory vs. self-regulated nature of continuing education (CE). In motivation terms, mandatory CE would be seen to be externally regulated, i.e. "prescribed" by the organisation or by supervisors; to the extent that workers are involved in compiling their education portfolio, on the other hand, their CE would be internally regulated; we expect systematic age differences in the preferences for either type of motivation. Whilst SST has got little to say about the role of that locus of regulation (internal vs. external), the Self-Determination Theory of Motivation (SDT; e.g., Ryan and Deci, 2000) specialises in describing the differences between such types of motivation and the sets of internal and external rewards associated with those types. Combining SST and SDT might therefore be a fruitful way of future theory-building.

Although we failed to find support for all of our predictions with regard to the selected work context factors, the evidence presented in this study justifies our underlying rationale. Future research might use objective measures in addition to self-assessed MPCE to minimise common method variance and response tendencies. Comparative data on other age groups or, ideally, longitudinal studies could provide more insight on how work context factors influence MPCE in the long run. Further research might study work context factors' influence on MPCE from a utility perspective similar to the one we outlined in section 3.2. As an age-neutral process perspective, the utility framework is suitable for incorporating theories focusing on special de-

tails of motivation, explaining motivational deficits, enabling the design of motivational interventions and for connecting to economic theories as financial variables might well drive utility perceptions.

Given our findings, it seems necessary to acknowledge the dynamics of motivation across the life span, but also that age may not always be a good predictor of an individual's developmental status. This calls for both a general "life-span approach" to HR development but also for individual treatment, acknowledging current goals and life situation. For instance, as work motivation does not generally decline with age but becomes increasingly task-specific, depending on changing personal life goals (see Stamov Roßnagel & Hertel, 2010), MPCE might also develop along shifting areas of personal interest and relevance. From a practical perspective, HR development can focus on recognising these changes and design training accordingly. Motivated older workers should signal their interest in continuing education rather than resign or wait for training to be offered. After all, some 25% of companies would offer their older employees more continuing education if they were convinced those workers were motivated (Stettes, 2009, p. 10).

3.6 Appendix

Table 3-5: Main results of categorical data

Variable	Category	Percentage
Security of Employment	1="fully applicable"	63.8
	2	22.1
	3	4.8
	4	7.0
	5="not at all applicable"	2.4
Temp. work contract	Yes	6.1
Working Hours	Full time (35 hours/week or more)"	74.6
	Part time (15–35 hours/week)"	19.6
	Marginally employed (less than 15 hours/week)"	5.8
	Unemployed	0
Past participation	0 trainings	29.4
	1–3 trainings	36.7
	≥ 4 trainings	33.9
Company Size	<10 employees	14.1
	10–49 employees	25.6
	50–99 employees	13.1
	100–249 employees	14.9
	250–499 employees	9.0
	≥500 employees	23.3
Desire to Work past Retirement Age	1="Yes"	24.3
	2="Rather yes"	23.0
	3="Rather no"	19.2
	4="No"	33.6
Gender	Female	51.7

Main results of categorical data for the analysed sample (n=1,500).

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4. A life-span perspective on life satisfaction

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Abstract: The German population is ageing due to decreasing birth rates and increasing life expectancy. To sustain the German pension system, legal retirement age is increased step by step to 67 years. This raises questions about how to enable and motivate older individuals to work that long. Hence, it is important to understand whether they represent a homogeneous group that can be addressed through specific measures and instruments. Life-span theory points to systematic changes as well as increased heterogeneity with age. For example, work motivation does not generally decline with age but becomes increasingly task-specific, depending on changing life goals and individual adaptation processes in adult development. In this empirical study we analyse age heterogeneity with regard to current life satisfaction and life satisfaction domains (measured as satisfaction with work, income, family and health) that represent personal utilities individuals strive for. For our analysis we use data collected as part of a representative German longitudinal data study (SOEP[1]). We find increasing heterogeneity in current life satisfaction, satisfaction with work, family life, and health with age. Thus, common mean level analyses on age effects yield only limited informative value. The heterogeneity of older adults should be taken into account when motivating and developing older workers.

Keywords: Life satisfaction, heterogeneity, life-span, older workers, ageing

4.1 Introduction

The changing demographics of Germany and other mature societies involve increased life expectancy, lower fertility rates and a negative net migration. Germany's steadily ageing working-age population group (Birg, 2005; Börsch-Supan & Wilke, 2009) is expected to decrease by 6.5 million until the year 2025 (Bundesagentur für Arbeit[2], 2011). In order to stabilize the

[1] The data used in this publication was kindly provided to us by the German Socio-Economic Panel Study (SOEP) at the German Institute for Economic Research (DIW), Berlin. The German Socio-Economic Panel is a representative longitudinal study of private households..
[2] German Federal Labour Market Authority.

main pillar of the German pension system, the pay-as-you go-pension system, pension entry age is increased step-by-step to 67 years, effectively prolonging working life (Bundesministerium des Innern[3], 2011). For Germany, a representative poll in 2008 showed almost half of older working individuals aged between 55 to under 65 can well or rather well envision working past retirement age (Büsch, Dorbritz, Heien, & Micheel, 2010) and most also have the cognitive and physical abilities to do so (see Baltes, Lindenberger, & Staudinger, 2006; Tesch-Römer, Heribert, & Wurm, 2006).

Empirical studies have shown the importance of organisational factors on the process of retirement but also personal factors, with evidence that older workers motivated to work past retirement age can be broadly separated into two groups. Those who need to work longer for financial reasons and those who take pleasure in their work and want to stay longer (see McNair, 2006). In the latter case, key engagement factors in the organisational context are the experience of recognition at work as well as management and team support (Saba & Guerin, 2005; also Van Dam, van der Vorst, & van der Heijden, 2009). Life-span theories point to fundamental shifts in goal engagement in later life (see Heckhausen, Wrosch, & Schulz, 2010), emphasizing the increasing importance of short-term goals and emotional well being over long-term goals such as career-building (Stamov Roßnagel & Hertel, 2010). These changing life goals reflect the developmental tasks of the respective life phase of an individual (Nurmi, 1992) and may determine work and motivation to participate in continuing education over a life-course. Analysing age-related changes in satisfaction with life and life domains such as work, family life or income can yield information on goal engagement and disengagement. While mean-level analyses yield important information on normal ageing trajectories they are limited in capturing variability within and between cohorts that can be observed in many areas of research. Increasingly, life's developmental phases such as raising children or entering retirement fall into wider age spans, hence, individuals within age groups may well lead very different lives. As a consequence, organizations need to think beyond mere age-compensatory measures (i.e. for cognitive and physical functioning) for their older workforce and appreciate the heterogeneity of their older workers.

Our paper will first provide a short background on observations of age instabilities and life satisfaction research. With regard to central theories of regulation across the life-span we shall then postulate our hypotheses and expected findings. Thirdly, we conduct analyses to test

[3] German Federal Ministry of the Interior.

our hypotheses and discuss results with regard to previous findings on the subject. The paper closes with a conclusion, delineating implications for organisations and policy-makers and outlining directions for further research.

4.2 Age instabilities

Studies from various disciplines suggest that as people age, they become more heterogeneous, so looking only at measures of central tendency may hide the actual differences (see meta-analysis by Nelson & Dannefer, 1992). This decrease in inter-individual stability can be seen as a natural development as older individuals will have led different lives that made them adapt their behaviour and attitudes. The variation between individuals (inter-individual stability) can be distinguished from the changes within an individual that may also occur over time (intra-individual stability). In their meta-analysis of empirical studies on age changes in human behaviour and performance, Bornstein and Smircana (1982) note the general focus on mean behaviour over time and the lack of studies that analyse the variances of these findings. Their analysis of 23 studies yields "larger intersubject variances for older subjects in nine different studies, smaller variances in six cases, and mixed results in the remaining eight instances." (Bornstein & Smircana, 1982, p. 260).

Neuropsychological research on cognitive functioning shows intellectual abilities to generally decline with age but also to have increased test-score heterogeneity (Ardila, 2007; Schaie, 1994). In the field of gerontology, studies show socioeconomic differences in health to grow with increasing age, only lessening again in very old age (House, Lantz, & Herd, 2005). Not surprisingly, growing disparities in health and other personal characteristics also mirror the cumulative effects of individuals' different material and personal resources in their lifetime (Dannefer, 2003; Hertzman, Frank, & Evans, 1994).

This growing apart is also reflected in consumer research in terms of needs, lifestyle and consumption (Moschis, Lee, & Mathur, 1997; Sherman & Schiffman, 1991; Sudbury & Simcock, 2009). Although a number of studies show the elderly consumer segment to be heterogeneous, these segmentations usually present a snapshot of a particular moment and do not follow the development of individuals as they age and when or why they grow apart. However, it seems that at some point in a person's life, chronological age ceases to be a good predictor of behaviour, though it seems to be uncertain when exactly or why. One approach to this problem

involves replacing chronological age with cognitive age as a segmentation criterium (Barak & Schiffman, 1981; Wilkes, 1992) or using the individual's life phase as a predictor of behaviour. Additionally, social sciences also highlight the impact of social environment and processes on social, psychological, and also physical changes in individual life patterns. Thus, regular sorting and allocation processes lead to differentiation between and within cohorts. Other explanations for increased inter-individual heterogeneity involve an increased fanning out or accentuation of individual characteristics (Dannefer, 1987).

For motivating and training an ageing workforce, it is necessary to identify common changes that occur with age as well as appreciate older worker's increased variability in work-relevant variables. This heterogeneity is, e.g., reflected in Ilmarinen's Workability Index (Ilmarinen, 2007). Apart from growing health disparities, older workers' formal education has been some decades in the past and they have had quite different (e.g., developmental) experiences in the meantime (Hansson, Robson, & Limas, 2001). Indeed, worker's life or career phases need not be related to age at all, as becomes apparent in increasingly diverse work and life biographies. Furthermore, motivators, contents and settings of work and training need to be re-evaluated as well. Gegenfurtner and Vauras (2012) show that with increasing age, individuals prefer personally meaningful and socially rewarding behaviours (also Mather & Carstensen, 2005). They also show increased interest in activities that produce positive affect (Kanfer & Ackerman, 2004). However, older individuals still pursuing career goals do exhibit strong achievement motivation that is otherwise more typical for younger adults (Greller, 2006). These findings add insight to goal engagement and disengagement over individuals' life-span that have a significant effect on (work) motivation and hint at a greater variety of factors underlying, e.g., work or training motivation at older ages.

4.2.1 Life satisfaction

As most human beings try to be happy in life, life satisfaction can be assumed to be a widely shared goal of humanity. Generally, being satisfied with life means "having a favourable attitude toward one's life as a whole" (Haybron, 2007, p. 2), implying "a global evaluation by the person of his or her life" (Pavot, Diener, Colvin, & Sandvik, 1991, p. 150). Economically speaking, life satisfaction represents a personal utility that individuals strive for, thus organisations and policy-makers need to be aware of its dynamics and how their actions impact it (Fennell, 1991;

Noll, 1999; Sirgy et al., 2006; Dolan, Layard, & Metcalfe, 2011). It is characteristic for this line of research that subjective rather than objective criteria of life quality are judged, so as to capture "true" personal satisfaction.

When comparing empirical and theoretical studies on life satisfaction there are almost as many life satisfaction measures as there are studies (Rain, Lane, & Steiner, 1991). Hence, the phenomenon of life satisfaction studies yielding different results for stability might be largely due to different components measured. However, according to the OECD's (2013) guidelines, measuring the higher-level concept of subjective well-being entails both a cognitive and an affective evaluation of life. The affective evaluation of life can include measurement of anger, worry or happiness. The cognitive evaluation of life is measured as life satisfaction and may include its specific sub-domains such as satisfaction with work, health or income. In our study we shall focus on measuring life satisfaction as a cognitive evaluation of life and specific domains, as implemented in our data source, the German socio-economic panel.

In surveys, respondents seem to evaluate stable and chronically accessible sources of information on life domains, that are repeatedly used each time the question is asked to come to an overall judgment on life satisfaction, as studies using source reports demonstrate (Schimmack, Oishi, Furr, & Funder, 2004). This bottom-up part of the judgment based on stable sources of information is thought to be responsible for the rather stable course of life satisfaction; variability may be added by situational and temporal factors such as mood (Veenhoven, 1998), interview situation or the occurrence of significant life events. A top-down effect in this judgment may result from the influence of relatively stable personality traits on the evaluation of the chronically accessible information used in the judgment – also assumed to represent a stable factor in life satisfaction evaluations, especially after age 50, when rank-order consistency of personality factors seems to peak (Lucas & Donnellan, 2007).

Empirically, life satisfaction does seem to be quite stable in the long run (Pavot & Diener, 1993), with few gender differences. Regarding the mean-level, older studies from the 1970s show a positive but small correlation of life satisfaction and age for the U.S. (Herzog & Rodgers, 1981). Other studies suggest an approximation of a U- (or rather S-) curve, with life satisfaction first decreasing, reaching its minimum around midlife, followed by an increase and then dropping sharply in the last few life years (see e.g., for the British and German population Baird, Lucas, & Donnellan, 2010; Wunder, Wiencierz, Schwarze, & Küchenhoff, 2013). Explanations for the midlife change include the reorganization of goals no longer attainable and

coping skills with regard to goals not achieved so far (Blanchflower & Oswald, 2008). For the German population, SOEP data show mean life satisfaction to remain relatively stable until late life (Baird et al., 2010).

With regard to relative or rank stability, Erhardt, Saris, and Veenhoven (2000) find less than 30% of the original rank order in life satisfaction remains the same over time, implying that individual life satisfaction is only moderately stable and can change significantly and lastingly over time (similar Diener, Suh, Lucas, & Smith, 1999; Fujita & Diener, 2005). Events with a strong situational impact, significant lead or lag and sometimes lasting effects on life satisfaction include a change in income, birth of a child, marriage, divorce, widowhood, unemployment (especially for men: Clark, Diener, Georgelis, & Lucas, 2008), caring for disabled family members or becoming disabled (OECD, 2013). The impact of societal or global events is small, e.g., catastrophes such as Chernobyl hardly affected individual life satisfaction levels in Germany (Berger, 2008). Generally, life circumstances such as health, social contacts, good income, education, and being in a relationship, increase life satisfaction (see Dolan, Peasgood, & White, 2008; Sacks, Stevenson, & Wolfers, 2010).

A meta-analysis of well-being studies finds a strong influence of (rather hereditary) personality on life satisfaction (Steel, Schmidt, & Shultz, 2008). The influence of personality traits on life satisfaction is less well documented than on affective measures of well-being such as happiness, but point to cheerfulness (a facet of extraversion) and depression (a facet of neuroticism) as the strongest predictors of life satisfaction (Diener et al., 1999; Schimmack et al., 2004). As there is evidence that personality changes over the individual life-span – older persons show on average less extraversion and neuroticism but rising levels of conscientiousness and agreeableness (Srivastava, John, Gosling, & Potter, 2003) – it can be assumed that this also accounts for changes in life satisfaction over the life-span.

Related to that, individual preferences and choices strongly and lastingly affect life satisfaction, too, adding further support for an only moderately stable life satisfaction (Headey, Muffels, & Wagner, 2010) – contrary to set-point theory, which posits life satisfaction to be stable in the medium and long run (always returning to an individual set-point). In that respect, significant choices are life goals and values, work-life-balance, social participation and a healthy lifestyle. These goals favourable to life satisfaction can be broadly categorized as non-zero-sum goals (no-one loses as I gain, e.g., social engagement) – as opposed to zero-sum goals such as career promotion or status (Headey, 2008). These insights lend support to authentic happiness theory,

proposing that life satisfaction is closely connected the experience of purpose and engagement and the pursuit of altruistic goals (Seligman, Parks, & Steen, 2004). However, it is acknowledged that people do not pursue only one type of life goal throughout their lives. Rather, a succession of goals as people move through their life stages is the norm, as we will elaborate later.

4.2.2 Life satisfaction domains

The so-called life domain or additive approach explains life satisfaction judgments with the net outcome of satisfaction in life domains. Older empirical studies from the 1970s show a linear relationship between life satisfaction domains (except for health) and age (Herzog & Rodgers, 1981). But one could also argue for a negative relationship or compensation, e.g., higher work satisfaction can only be achieved at the cost of overall lower life satisfaction and vice versa. As Rice, Frone, and McFarlin (1992) note, with an additive model, "indicators of domain-specific quality of life are the only direct determinants of overall quality of life. The effects of any other variables on overall quality of life must be indirect (i.e. mediated by the quality of life in one or more domains)" (Rice et al., 1992, p. 156). Despite empirical support for this popular model its simplifying approach has also been questioned, as the ability to substitute losses in one domain with gains in another is likely to be subject to individual importance attached to the domains and decreasing marginal returns (Rojas, 2007).

Empirically, spillover hypothesis, i.e. the idea that domains influence each other and life satisfaction altogether, also reciprocally, implying a positive correlation, has seen the most support. This means any decrease in, e.g., work satisfaction can be offset by an increase in other life satisfaction domains, such as satisfaction with health, which is also strongly positively correlated to overall life satisfaction (Sirgy, Mentzer, Rahtz, & Meadow, 1991). Longitudinal data from the British Household Panel show domain satisfactions may have different trajectories than overall life satisfaction, and declines in some areas, e.g., health, can be offset by increases in other areas such as satisfaction with income, work, social life or amount of leisure time (see McAdams, Lucas, & Donnellan, 2014). Also, moderator variables have been discussed, such as personal importance of domains (disaggregation hypothesis, see Rice et al., 1992) but also cultural and economic conditions of the environment, e.g., financial satisfaction correlates more strongly with life satisfaction in poorer countries (Diener & Diener, 1993).

According to a meta-analysis by Cummins (1996), the most relevant life domains contributing to life satisfaction are economic condition, family circumstances, health, and work. Argyle (2001) analyses domains such as money, health, job and employment, social relationships, leisure, housing, and education.

In a meta-analysis of studies on the relationship between work satisfaction and life satisfaction about half the studies analysed found work satisfaction to contribute significantly to beta weights in prediction of life satisfaction with correlations ranging from 0.04–0.58 with a median of 0.31 (Rain et al., 1991). Analysing German and British panel data, Wunder et al. (2013) show work satisfaction to be fairly stable over the life course with an upward movement 10 or 15 years before retirement. Satisfaction with household income is on the increase from around age 50, satisfaction with housing situation from around age 30 – these two domain satisfactions can be understood as indicators of a person's financial satisfaction and strongly contribute to the upward trend of general life satisfaction at middle age (the positive influence of income on life satisfaction judgments is also documented by Diener, Kahnemann, Arora, Harter, & Tov, 2009).

Health satisfaction in Germany declines on average with only a small interruption around age 60 (Wunder et al., 2013). Family satisfaction may be seen as a composite of both partnership satisfaction and family life including children and exhibits the strongest influence on general life satisfaction (Schulz, Gluske, & Lentsch, 1996). While longitudinal studies have shown marital satisfaction to decline with marriage duration, this pattern is not necessarily tied to the family life cycle (Vaillant & Vaillant, 1993; VanLaningham, Johnson, & Amato, 2001). The U-curve pattern found in a number of cross-sectional studies may be due to a cohort effect of older age cohorts being married at a time when long-lasting marriages were normal and less was expected of them, leading to more contentment. The effect of children on marital and individual life satisfaction is more complex and may be slightly negative (McLanahan & Adams, 1989; Nelson, Kushlev, & Lyubomirsky, 2014).

Satisfaction with a particular life satisfaction domain can signify attainment of personal goals in that domain. For example, work satisfaction can be taken as a reflection of the extent career goal(s) have been met, such as holding a fulfilling job or having a desired position in an organisation (Easterlin, 2006). But it can also imply that one has come to terms with non-achievement in a particular domain of life or simply places more value on what has been achieved (contentment). As life satisfaction measures are typically cognitive assessments, cognitive development and its relation to emotion and personality development over the life-span

need to be considered (see Lewis, 1995) but understanding the reasons for inter- and intra-individual variability is difficult as the life-span is long and involves many possible influencing events that may contribute to changes (see Baltes et al., 1998). Thus, in the following, we shall view life satisfaction in the context of the adult life-span approach.

4.3 Life-span development

Since roughly the 1970s life-courses of individuals have exhibited lesser degrees of standardization. This becomes apparent when important life events such as marriage, first or last child fall into increasingly wide age ranges (see Ravanera, Rajulton, & Burch, 2004). Originating from the discipline of developmental psychology, the life-span approach to individual adult development proposes that individual development and all adaptive processes over someone's life cover an entire life-span – from conception to very old age (see Baltes et al., 1998; Kanfer & Ackermann, 2004).

From this perspective, age effects on cognition, personality, and affect are not simply a decline but the result of patterns of losses, gains, reorganisation, and exchange that happen naturally over a lifetime. Losses mostly occur to fluid intelligence needed for, e.g., abstract thinking, memory and processing information (Schaie, 1994). As a consequence, older workers need to make more effort and invest more resources in their work. On the other hand, they gain on crystallized intelligence – educational knowledge, work experience and vocabulary (Ackerman, 1996). Apart from gains and losses, motives behind actions may be reorganised, meaning as people age, they may work for different reasons than in their youth. Furthermore, motives may exchange priorities as personality changes. While on average the trait of openness to experience declines with age and conscientiousness increases, there is also an increase in generative motives and a preference for actions inducing positive affect and identity (also reflected in older individuals' consumption, see Schau, Gilly, & Wolfinbarger, 2009).

In their adaptation of the expectancy-value framework of motivation, Kanfer and Ackerman (2004) use these findings to show age-related changes in work motivation (for a discussion of motivational theories see Eccles & Whigfield, 2002). While individuals evaluate their chances of success if they engage in a particular action, they also bear in mind their effort and the outcome's value to them, before they are in fact motivated to act. With regard to work motivation, this implies that with age, motivation for tasks relying on mostly fluid intelligence

decreases as chances of success decrease and required effort increases. At the same time, career outcomes lose their importance as goals' priorities shift and motives for work change. Individuals take into account their time left in life and re-evaluate their goals.

Socioemotional selectivity theory (a life-span theory of motivation) posits that goal engagement and disengagement depend on the perceived time left. Two major processes are affected: the acquisition of knowledge and the regulation of emotional state. If the time-horizon is sufficiently long, an individual will be more motivated to increase knowledge, gather future-relevant information and pursue new experiences. If the perceived time horizon is shorter, quickly realisable goals, experiencing pleasant emotion, living in the present moment, and enjoying social contacts become more important (Carstensen, 2006).

In order to cope with functional, material or personal losses, ageing adults increasingly redirect their resources from growth towards maintenance or recovery, and later, management of loss (Baltes et al., 1998). By means of various strategies of coping and adaptation, individuals still achieve similar levels of life satisfaction while going through different developmental processes. Life-span theory predicts that resources will be invested in life domains that are especially relevant in the respective life phase and associated tasks. Accordingly, Ryff (1989) finds younger adults to draw their life satisfaction primarily from their career and accomplishments, whereas for older adults good health and the ability to accept change and their overall situation become more important to life satisfaction. Brandstädter and Rothermund define this assimilative behavior in their dual-process framework. To "avoid situations of entrapment and escalating commitments that may arise not only in personal life but also in broader organizational contexts" (Brandstädter & Rothermund, 2002, p.141), individuals may change their goals in order to come to terms with a given situation that cannot be changed or make an effort to change a situation in order to achieve one's goals.

As life courses have become less standardized in the past decades (Brückner & Mayer, 2005; Ravanera et al., 2004; Widmer & Ritschard, 2009) and individuals exhibit increased variability with age both physically and mentally, we hypothesise that,

H1: Heterogeneity in life satisfaction increases with age.

We expect work satisfaction to exhibit more intracohort heterogeneity with age. Drawing on our theoretical framework, with increasing age and decreasing time left individuals either realize their career goals or have to acknowledge failure. This may lead to a greater spectrum of work satisfaction evaluation. Additionally, we expect differences between individuals to become larger

as work biographies and employment patterns have become more diverse in the past decades. This leads us to hypothesise,

H1a: Heterogeneity in work satisfaction increases with age.

While household income satisfaction may contribute less to current life satisfaction with age, as in line with life-span theory, affective and social goals become more important than status-driven and materialistic goals it is still likely to be an assessment formed on the basis of actual household income. Thus, we expect heterogeneity to increase with age, as household income and standard of living increasingly depend on influences of previous life phases (Schütze, 2012), mirroring the growing apart of individuals with regard to work and family trajectories during the last decades, even though standards of living have generally improved (Easterlin, 2000). We expect that,

H1b: Heterogeneity in household income satisfaction increases with age.

Family satisfaction is predicted to follow a similar pattern. We expect levels of satisfaction with family to become more heterogeneous with age as individuals deal in different ways with the degree of realization of their family and partnership goals. We posit,

H1c: Heterogeneity in family satisfaction increases with age.

Objective health status becomes more varied with age so we expect satisfaction with health to exhibit a higher level of heterogeneity with increasing age. We thus hypothesise,

H1d: Heterogeneity in health satisfaction increases with age.

4.4 Empirical analysis

Our empirical analysis is based on data collected as part of the longitudinal German Socio-Economic Panel (SOEP), that is fully described elsewhere (TNS Infratest Sozialforschung, 2014).

4.4.1 Data set and collection

The German SOEP is a long running representative panel with refreshment samples under academic direction of the DIW Berlin (Deutsches Institut für Wirtschaftsforschung[4]) that conducts interviews in private German households on an annual basis. To gather the data, the fieldwork organisation TNS Infratest Sozialforschung approaches almost 11,000 households

[4] German Institute for Economic Research.

and more than 20,000 individuals annually and samples data on household composition, occupational biographies, employment, earnings, health and satisfaction indicators. In 1984, the panel started with 6,000 questionnaires, accomplishing its 31st wave in 2014. Topics in the annual questionnaire are wide-ranging and cover economics, sociology, political science, psychology and geography, using both objective as well as subjective indicators. Core questions include demography, qualification, labour market and occupational dynamics, income, housing, health, basic orientations (such as values and preferences) as well a satisfaction with life and related life domains. In 1990, with the German reunification, Eastern Germans have been included in the panel and more additions (e.g., immigrants, high income samples) were added over the course of the years. With regard to methodology, a mix of standardized instruments is used to obtain data.

For our analysis we limit the sample to working German adults between the ages of 25–66, excluding younger individuals whose personalities may still be subject to change and also older persons past retirement age.

Life satisfaction measures. Since the first wave in 1984 and as the last question in the survey, SOEP annually measures our dependent variable (DV) life satisfaction asking (with slight variations), "How satisfied are you with your life, all things considered?" on a 0–10 ("completely dissatisfied" to "completely satisfied") Likert-type scale, which has achieved sufficient validity also in other surveys (see Diener et al, 1999; Lucas & Donnellan, 2007).

Life satisfaction domains. Since 2007, SOEP measures domain satisfaction on an annual basis. Respondents are asked "how satisfied are you today with the following areas of your life?", then given about ten items on a 0–10 ("completely dissatisfied" to "completely satisfied") Likert-type scale. In the SOEP survey, domain satisfaction scales are embedded in the first block of questions since the second wave in 1985. Domains always covered health, work (if working), household activities (if active in household), household income and habitation. Alternatingly, domains such as living area, public transport, childcare (if preschool children live in the household), school and vocational education, leisure time (amount and activities), standard of living, family life, sleep and personal income are included in the survey. For our purposes we only analyse satisfactions with work, household income, health, and family, which also represent the most commonly covered life satisfaction domains of other international surveys.

Measure of heterogeneity. As we are interested in the heterogeneity in the various satisfaction items we compute a normalized Shannon Entropy Index (Shannon, 1948) for each satisfaction item, age group, and survey wave:

$$S = -100 \sum_{c=0}^{10} p_c \log_{11} p_c$$

where p_c denotes the relative frequency of answers in category c (0–10: "completely dissatisfied" to "completely satisfied") of the respective satisfaction item. The index varies between 0 (no heterogeneity, all answers are in the same category) and 100 (maximal heterogeneity, the answers are uniformly distributed over all categories). Shannon Entropy is a standard measure of heterogeneity and diversity (Masisi, Nelwamondo, & Marwala, 2008) in, e.g., ecology (De'ath 2012; Ricotta & Szeidl, 2006), and life course research (Widmer & Ritschard, 2009). It is particularly suitable for describing discrete distributions with small number of categories where measures like standard deviation would be of limited use as is the case for the 11-point Likert-type scales used in the SOEP.

To guarantee a sufficiently large number of respondents to compute the index scores for each age group and survey wave we need to define an age group to consist of two birth cohorts, i.e. all respondents born in, e.g., 1919 and 1920 are members of the same age group. The age associated with an age group is the average age of their members at the time they were interviewed. Accordingly, the thus constructed panel data set of satisfaction heterogeneity indices includes only every second year of the SOEP data to avoid that any respondent becomes a member of more than one age group.

4.4.2 Analysis and results

In the following, we report regression estimation results for a number of panel data models with our heterogeneity indices as dependent variables and age and age^2 as independent variables. An increase (decrease) in heterogeneity with age would be indicated by a significant positive (negative) estimated coefficient for age. In more complex models we also include the survey year and its interaction with age to test whether any age effects on heterogeneity are stable over time or whether they have changed during the time SOEP data is available.

While separate F-tests indicate that ordinary least squares models would not be appropriate, rather fixed effects or random effects regression models are needed to account for the heterogeneous intercepts ($p<0.01$), augmented Dickey Fuller tests (Dickey & Fuller, 1979) indicate that no panel time series has unit roots ($p<0.01$), i.e. they are all stationary.

Current Life Satisfaction. In a first model (see Table 4-1) we estimate a two-way fixed effects panel model with dummy variables for each (two-year) cohort and survey year. This fixed effects estimator explains (some of) the within-cohort variation in the data. The coefficients for both age and age^2 are statistically significant. Their signs indicate that heterogeneity in current life satisfaction increases with age at a decreasing rate, corroborating our hypothesis H1. The second fixed effects model where we substitute the survey year dummy variables for a continuous survey year variable[5] additionally shows that average heterogeneity over all cohorts decreases over time while the age gradient is increasing. Consequently, the observed substantial increase in heterogeneity in current life satisfaction with age seems to be partly driven by a decrease in heterogeneity in younger, more recent cohorts. Finally, since the Hausman test (Hausman, 1978) does not reject the consistency of the potentially more efficient random effects estimates that also use the between cohort variation we report the regression results of such a regression as well. This third model confirms the earlier results. Heterogeneity in current life satisfaction increases with age at a decreasing rate and is on average over all cohorts decreasing over the number of years while the age gradient is increasing.

[5] We cannot include both since the survey year dummy variables are collinear with the continuous survey year variable.

Table 4-1: Current Life Satisfaction

Current Life Satisfaction			
	Model I **Two-way fixed effects**	**Model II** **One-way (individual) fixed effects**	**Model III** **One-way random effects**
Variable	**Coefficients** **(Std. error)**	**Coefficients** **(Std. error)**	**Coefficients** **(Std. error)**
Intercept			42.113 *** (3.375)
Age	5.039 * (2.083)	5.692 ** (2.188)	1.278 *** (0.150)
Age²	–0.007 *** (0.002)	–0.015 *** (0.003)	–0.012 *** (0.002)
Year		–5.000 * (2.145)	–0.726 *** (0.095)
Age:year		0.016 *** (0.005)	0.0126*** (0.002)

Random effects	**var**	**std. dev.**	**share**
Ideosyncratic	5.35	2.31	0.81
Individual	1.25	1.12	0.19

Statistics			
Unbalanced Panel	n=35, T=1–15, N=315		
Adjusted R^2	0.099	0.292	0.828
F-statistic	17.638 on 2 and 264 DF	34.575 on 4 and 276 DF	412.086 on 4 and 310 DF
Prob (F-statistic)	<0.001	<0.001	<0.001
Hausman test		X^2 = 7.88, df = 4, p-value = 0.096	

*p<0.05, **p<0.01, ***p<0.001

Adjusted R^2 statistics for the fixed effects models do not include the variance explained by cohort and survey year dummy variables. Standard errors are robust to heteroskedasticity and correlation of arbitrary form within clusters (HC3 with clusters; see, e.g., MacKinnon & White, 1985).

Satisfaction with work. Similar to before we estimate first a two-way fixed effects panel model with dummy variables for each (two-year) cohort and survey year (see Table 4-2). Since the Hausman test indicates that random effects estimates would be inconsistent we do not report random effects regression results. In the first model, only the coefficient for age is statistically significant, it is positive and of substantial size. The second fixed effects model shows an additional statistically significant negative survey year effect. Age² and its interaction with the survey year are not significant. However, the second model itself is overall not statistically sig-

nificant (F-test, p>0.05). Therefore we can only rely on model I that would indicate an increase in the heterogeneity in work satisfaction with age, corroborating our hypothesis H1a. Still, the explained variance as indicated by the adjusted R^2 is rather small.

Table 4-2: Satisfaction with work and household income

Life Satisfaction Domains:				
	Satisfaction with work		**Satisfaction with household income**	
Variable	**Model I Two-way fixed effects**	**Model II One-way (individual) fixed effects**	**Model I Two-way fixed effects**	**Model II One-way (individual) fixed effects**
	Coefficients (Std. error)	**Coefficients (Std. error)**	**Coefficients (Std. error)**	**Coefficients (Std. error)**
Age	4.615 * (1.837)	4.063 * (1.996)	3.103 (1.933)	3.843 (2.339)
Age^2	–0.003 (0.002)	–0.000 (0.003)	–0.003 (0.002)	–0.006 (0.005)
Year		–3.821 * (1.899)		–3.570 (2.336)
Age:year		–0.006 (0.005)		0.005 (0.007)
Statistics				
Unbalanced Panel	n=35, T=1–15, N=315			
Adjusted R^2	0.032	0.029	0.015	0.057
F-statistic	5.276 on 2 and 264 DF	2.380 on 4 and 276 DF	2.377 on 2 and 264 DF	4.770 on 4 and 276 DF
Prob (F-statistic)	0.006	0.052	0.095	0.001
Hausman test		X^2 = 14.5, df = 4, p-value = 0.006		X^2 = 161, df = 4, p-value < 0.001

*p<0.05, **p<0.01, ***p<0.001

Adjusted R^2 statistics for the fixed effects models do not include the variance explained by cohort and survey year dummy variables. Standard errors are robust to heteroskedasticity and correlation of arbitrary form within clusters (HC3 with clusters; see, e.g., MacKinnon & White, 1985).

Satisfaction with household income. Again, we first estimate a two-way fixed effects panel model and then a one-way fixed effects panel that includes the survey year as a continuous variable instead of separate survey year dummy variables (see Table 4-2). The Hausman test indicates that random effects estimates would be inconsistent so we do not report random effects regression results. None of the estimated coefficients turn out to be statistically significant even

though signs and sizes correspond to the estimates for satisfaction with work. We therefore do not find statistically significant support of our hypothesis H1b of increasing heterogeneity of satisfaction with income with increasing age.

Table 4-3: Satisfaction with family

Life Satisfaction Domains: Satisfaction with family				
Variable	**Model I** **Two-way fixed effects** **Coefficients (Std. error)**	**Model II** **One-way (individual) fixed effects** **Coefficients (Std. error)**	**Model III** **One-way random effects** **Coefficients (Std. error)**	**Model IV** **One-way (individual) effect between model** **Coefficients (Std. error)**
Intercept			59.634 *** (7.301)	56.491 *** (6.229)
Age	–2.146 (2.564)	–5.443 (5.253)	0.871 * (0.351)	1.114 ** (0.298)
Age²	0.002 (0.005)	0.056 (0.044)	–0.009 * (0.004)	–0.012 ** (0.003)
Year		4.597 (4.932)	–1.239 *** (0.358)	
Age:year		–0.108 (0.085)	0.022 * (0.008)	

Random effects	**var**	**std.dev.**	**share**
Ideosyncratic	3.33	1.82	0.62
Individual	2.04	1.43	0.38

Statistics				
Unbalanced Panel	n=24, T=1–4, N=84			
Adjusted R^2	0.007	0.105	0.698	0.352
F-statistic	0.287 on 2 and 55 DF	2.631 on 4 and 56 DF	56.316 on 4 and 79 DF	7.067 on 2 and 21 DF
Prob (F-statistic)	0.752	0.044	<0.001	0.005
Hausman test		X^2 = 6.35, df = 4, p-value = 0.175		

*p<0.05, **p<0.01, ***p<0.001

Adjusted R^2 statistics for the fixed effects models do not include the variance explained by cohort and survey year dummy variables. Standard errors for models I to III are robust to heteroskedasticity and correlation of arbitrary form within clusters (HC3 with clusters; see, e.g., MacKinnon & White, 1985).

Satisfaction with family life. As before we first estimate a two-way fixed effects panel model and then a one-way fixed effects panel that includes the survey year as a continuous variable (see Table 4-3). Since the Hausman test does not reject the consistency of the potentially more efficient random effects estimates we report the regression results of such a regression as

well. While none of the fixed effects estimates is statistically significant all random effects model coefficients are significant and of the opposite sign. This may indicate that the random effects estimates may be driven largely by a between cohort effect that is not visible in the fixed effects regression that capture the within cohort variation. Indeed, a between model (see model IV in Table 4-3) that uses the variation between cohorts and estimates the average effect over all years seems to confirm this. On average, older cohorts show more heterogeneity in their family satisfaction than younger cohorts. Average family satisfaction declines over all cohorts over the number of years while the differences between cohorts of different average age increases. In sum, while we cannot find direct support for increased heterogeneity with age, cohort effects corroborate our hypothesis H1c.

Satisfaction with health. As above we estimate first the two fixed effects panel models and then a random effects panel model since the Hausman test does not reject the consistency of its estimates (see Table 4-4). While the estimated age coefficients in the fixed effects panel models are not statistically significant[6] they are in the potentially more efficient random effects model. The random effects model reveals a similar pattern to the model for current life satisfaction. Heterogeneity in satisfaction with health increases with age at a decreasing rate. Further, average heterogeneity over all cohorts decreases with the number of years as indicated by the significant and negative coefficient for survey year. The estimated coefficient for the interaction effect between age and survey year, however, is not statistically significant and also very small, indicating the absence of a change in the age gradient over time. The positive and significant coefficient for age corroborates our hypothesis H1d: heterogeneity in satisfaction with health increases with age.

[6] Age and age^2 are, of course, correlated, that will inflate their standard errors.

Table 4-4: Satisfaction with health

Life Satisfaction Domains: Satisfaction with health			
Variable	**Model I** **Two-way fixed effects**	**Model II** **One-way (individual) fixed effects**	**Model III** **One-way random effects**
	Coefficients **(Std. error)**	**Coefficients** **(Std. error)**	**Coefficients** **(Std. error)**
Intercept			43.494 *** (5.376)
Age	2.539 (2.055)	3.062 (2.226)	1.562 *** (0.251)
Age^2	–0.011 *** (0.002)	–0.019 *** (0.005)	–0.015 *** (0.003)
Year		–1.742 (2.194)	–0.367 ** (0.127)
Age:year		0.014 * (0.007)	0.006 (0.003)

Random effects	**var**	**std. dev.**	**share**
Ideosyncratic	8.45	2.91	0.82
Individual	1.90	1.38	0.18

Statistics			
Unbalanced Panel	n=35, T=1–15, N=315		
Adjusted R^2	0.152	0.2	0.81
F-statistic	29.233 on 2 and 264 DF	20.396 on 4 and 276 DF	359.981 on 4 and 310 DF
Prob (F-statistic)	<0.001	<0.001	<0.001
Hausman test		X^2 = 1.79, df = 4, p-value = 0.775	

*p<0.05, **p<0.01, ***p<0.001

Adjusted R^2 statistics for the fixed effects models do not include the variance explained by cohort and survey year dummy variables. Standard errors are robust to heteroskedasticity and correlation of arbitrary form within clusters (HC3 with clusters; see, e.g., MacKinnon & White, 1985).

4.5 Discussion and conclusion

Heeding the call for more longitudinal research on life satisfaction (Heckhausen, et al., 2010) our study provides empirical support for central life-span theories using data collected as part of a representative German longitudinal panel: We find increasing heterogeneity in current life satisfaction, satisfaction with work, family life, and health with age. It seems important that organisations acknowledge older workers' individuality as ageing processes might differ substantially – both physically and mentally. Hence, standardised instruments or processes "for older workers" may not prove fruitful. Evidence for the systematic variation in our sample's distribution in terms of life satisfaction questions the common practice to compare individuals on measures of central tendency.

Longitudinal data analyses need to be taken with caution. When working with longitudinal data, there might be the problem of selection bias, meaning that possibly more stable persons remain in the study while others drop out over the years leading to an underestimation of the hypothesised and observed increase in heterogeneity with age, so selectivity analyses might provide insight whether attrition results in less or more stability for the remaining sample. However, we avoid problems arising from cross-sectional analyses that are prone to suffer from cohort effects – where environmental contexts, education and other factors may vary strongly between age groups leading to wrong conclusions about observed effects. As always, self-reported data such as life satisfaction evaluations have their own caveats, as respondents may answer strategically or inconsistently (Bertrand & Mullainathan, 2001). Especially older cohorts have been found to give socially desirable answers, although this effect is stronger for topics such as satisfaction with family and general life where lack of satisfaction may be more sanctioned than for work, income, and health (Herzog & Rodgers, 1981).

When we computed our heterogeneity indices we have not made use of the survey sampling weights for each respondent available in the SOEP data. Not using this information is introducing extra noise to our heterogeneity indices. While this does not affect the consistency of our estimates it renders them less efficient. To improve the efficiency of estimates, future research could simultaneously estimate the expected heterogeneity within each cohort and survey year from all the available individual data and its changes with age and over time. Future research may further test central theories of regulation across the life-span by analysing shifts

in the relative importance of life satisfaction domains over the life course which may indicate changes in goal engagement and disengagement. In our theoretical framework, life satisfaction domains associated with zero-sum goals (e.g., work satisfaction, household income, standard of living) can be expected to contribute less to life satisfaction with age, while life satisfaction domains associated with non-zero-sum goals (e.g., health, family life, leisure time) should contribute more to life satisfaction with age. Also, while we searched for undifferentiated age effects, differentiating for social subgroups will provide more information on the impact of social processes and socio-demographic influences.

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5. Overall conclusion

This dissertation provides evidence for the relevance of motivation to participate in continuing education (MPCE) as a driver of working past retirement age. Furthermore, I analyse the impact of work context influences on MPCE. Here, a specific contribution lies in the identification of age-related differences between younger and older workers. I also show that workers are increasingly heterogeneous as they age, a finding that corroborates central theories of life-span development.

First, I provide an understanding of the role of older workers in times of demographic change, their retirement transition, work motivation and development.

Second, I establish the relevance of older workers' MPCE for the policy of prolonging working life by showing the positive relationship with work ability and the desire to work past retirement age, corroborating Krapp (2005) and Beier and Kanfer (2009). Older workers' MPCE is high across all respondent groups, which is in line with the theory of age-related motivational maintenance (Gegenfurtner & Vauras, 2012), implying that inequalities in participation are less a result of varying motivation among subgroups, but of other barriers. Interestingly, evidence points to MPCE rather than participation in education to positively influence the desire to work past retirement age.

Third, I identify work context-related motivational differences between older and younger workers in line with research by Kanfer and Ackerman (2004) and Socioemotional Selectivity Theory. The empirical analysis finds weak but significant influences of some work context factors, suggesting an extension of the theoretical framework might be needed to accommodate the mandatory vs. self-regulated nature of continuing education.

Fourth, using longitudinal panel data I find evidence of increased heterogeneity and systematic changes across individuals' life-span with regard to life satisfaction and satisfaction with work, family and health, that represent personal utilities individuals strive for. Results corroborate research by Bornstein and Smircana (1982), House et al. (2005), and Nelson and Dannefer (1992), lending support to life-span theory. The findings also point to the informative limitations of the widely-used mean-level analyses of ageing individuals. Hence, a more differentiated approach to older workers seems warranted.

The empirical analyses presented are subject to limitations described in detail in the respective sections. Main points are that the data used in section 2 and 3 are cross-sectional and thus prone to cohort effects. Also, they are not fully representative of the older population. Generally, answers to questions about work ability, MPCE, working past retirement age, and life satisfaction may be subject to social desirability, thus not representing respondents' true opinion. Comparative data on other age groups, ideally longitudinal studies, could provide insight on shifts in the relative importance of life satisfaction domains over the life course and changes in goal engagement, also helping explain the dynamics of MPCE. This could incorporate objective measures as well as a utility framework connecting to economic theories as financial variables might well drive utility perceptions.

In sum, both human resource management as well as the development of labour market incentives for older individuals can be rendered more efficient by taking into account that older workers are a diverse group of individuals, often at very different stages of their lives in terms of, e.g., goals, career, family life or health. The prevalent practice of organisations to at most tend to their older workers' functional deficiencies may enable them but is unlikely to motivate them to remain in the workforce at older ages. A substantial number of older workers are healthy and very motivated to learn and curious for new experiences, they are also inclined to prolong their working life in times of a shrinking working population. Thus, more effort should go into establishing a culture of life-accompanying learning that fosters learning motivation. This is a field of action still largely untapped by organisations and governments alike.

5.1 References

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Selbständigkeitserklärung

Ich bezeuge durch meine Unterschrift, dass meine Angaben über die bei der Abfassung meiner Dissertation benutzten Hilfsmittel, über die mir zuteil gewordene Hilfe sowie über frühere Begutachtungen meiner Dissertation in jeder Hinsicht der Wahrheit entsprechen.

Berlin, 26.1.2015, Paula Thieme